SeeBeyond ICAN Suite™

SeeBeyond ICAN Suite Deployment Guide

Release 5.0

Version 20030904160313.

Contents

Chapter 1

Introduction

This chapter introduces you to this guide, its general purpose and scope, and its organization. It also provides sources of related documentation and information.

In this chapter

1.1 Overview

The Deployment Guide provides deployment planning guidelines and deployment strategies for the SeeBeyond® Integrated Composite Application Networks™ (ICAN) Suite. This guide is designed for management, system administrators, and others who are tasked with deployment of SeeBeyond eGate Integrator™ (eGate™).

The purpose of this guide is to help you successfully complete the following stages of deployment:

- Analyzing the project requirements
- Planning the deployment
- Determining system requirements
- Designing and developing eGate environment
- Testing eGate
- Transition to production
- Maintaining eGate environment

1.2 Contents of This Guide

This document includes the following information:

- **Chapter 1, "Introduction"** provides an overview of this document's purpose, contents, writing conventions, and supported documents.
- **Chapter 2, "Introducing eGate"** discusses the general features and architecture of eGate.
- **Chapter 3, "Analysis and Planning"** explains how to analyze your current business processes and information systems setup in order to plan your eGate deployment.
- **Chapter 4, "Determining System Requirements"** helps you gather relevant information and make decisions to determine the type of hardware required to support your eGate environment.
- **Chapter 5, "Designing and Developing the eGate Environment"** explains how to design and develop and create an eGate environment to best meet your overall business and information systems needs. It also contains valuable system optimization information.
- **Chapter 6, "Testing, Transition to Production, and Maintenance"** tells you what to do during the final phases of your eGate deployment, including pre-transition testing, the transition to production, and post-transition maintenance.

This guide also includes a **Glossary** on page 54. The glossary provides definitions of eGate terms.

1.3 Writing Conventions

The following writing conventions are observed throughout this document.

Table 1 Writing Conventions

Text	Convention	Example
Button, file, icon, parameter, variable, method, menu, and object names.	**Bold** text	▪ Click **OK** to save and close. ▪ From the **File** menu, select **Exit**. ▪ Select the **logicalhost.exe** file. ▪ Enter the **timeout** value. ▪ Use the **getClassName()** method. ▪ Configure the **Inbound** File eWay.
Command line arguments and code samples	`Fixed` font. Variables are shown in ***`bold italic`***.	`bootstrap -p` ***`password`***
Hypertext links	**Blue** text	For more information, see **"Writing Conventions" on page 7**.

Additional Conventions

Windows Systems

For the purposes of this guide, references to "Windows" will apply to Microsoft Windows Server 2003, Windows XP, and Windows 2000.

Path Name Separator

This guide uses the backslash ("\") as the separator within path names. If you are working on a UNI, or HP NonStop system, please make the appropriate substitutions.

1.4 Supporting Documents

For more information about eGate, refer to the following documents:

- *eGate Integrator Installation Guide*
- *eGate Integrator Tutorial*
- *eGate Integrator User's Guide*
- *SeeBeyond ICAN Suite Primer*

Refer to the *SeeBeyond Integrated Composite Application Networks Suite Primer* for a complete list of eGate-related documentation.

Chapter 2

Introducing eGate

This chapter gives a general overview of the eGate, including system descriptions, general operation, and basic features.

In this chapter

2.1 About eGate

The SeeBeyond eGate Integrator 5.0 system runs on a distributed and open architecture that enables components to reside on different servers/workstations within a global network. Depending on the communication protocols and adapters you choose, eGate can communicate with and link multiple applications and databases across a variety of operating systems.

2.1.1 System Versatility

eGate performs effectively with a wide variety of hardware, message standards, operating systems, databases, and communication protocols in both real-time and scheduled integration modes. eGate bridges older and newer systems to create a centrally managed, intelligent, unified enterprise. This gives administrators the flexibility to incorporate best-of-breed technology into their business strategy, without any need to uproot older information technology (IT) investments. eGate delivers a high level of precision, accuracy, and flexibility in the definition, detection, and control of cross-application business processes.

2.1.2 Project Organization

An eGate system is constructed with the Enterprise Designer, which is the primary graphical user interface (GUI) for configuring eGate. The components of an eGate system are organized into Connectivity Maps. A Connectivity Map is a configuration unit that contains all of the modules and parameters that control, route, and transform data as it travels through the eGate system. A Connectivity Map also maintains the relationships between the components, including the publish/subscribe information that serves as the bus of the data transportation process.

2.2 eGate Architecture

The eGate platform implements a transparent architecture that is well-suited for distributed computing environments. This means that the various components of an eGate system do not have to reside on the same machine. Instead, they can be distributed across several different machines in the network.

2.2.1 Runtime Components

eGate includes dynamic, flexible, and distributable runtime components with the following strengths:

- Connectivity
- Transformation
- Business Logic
- Persistence
- Maintainability
- Efficiency
- Monitoring

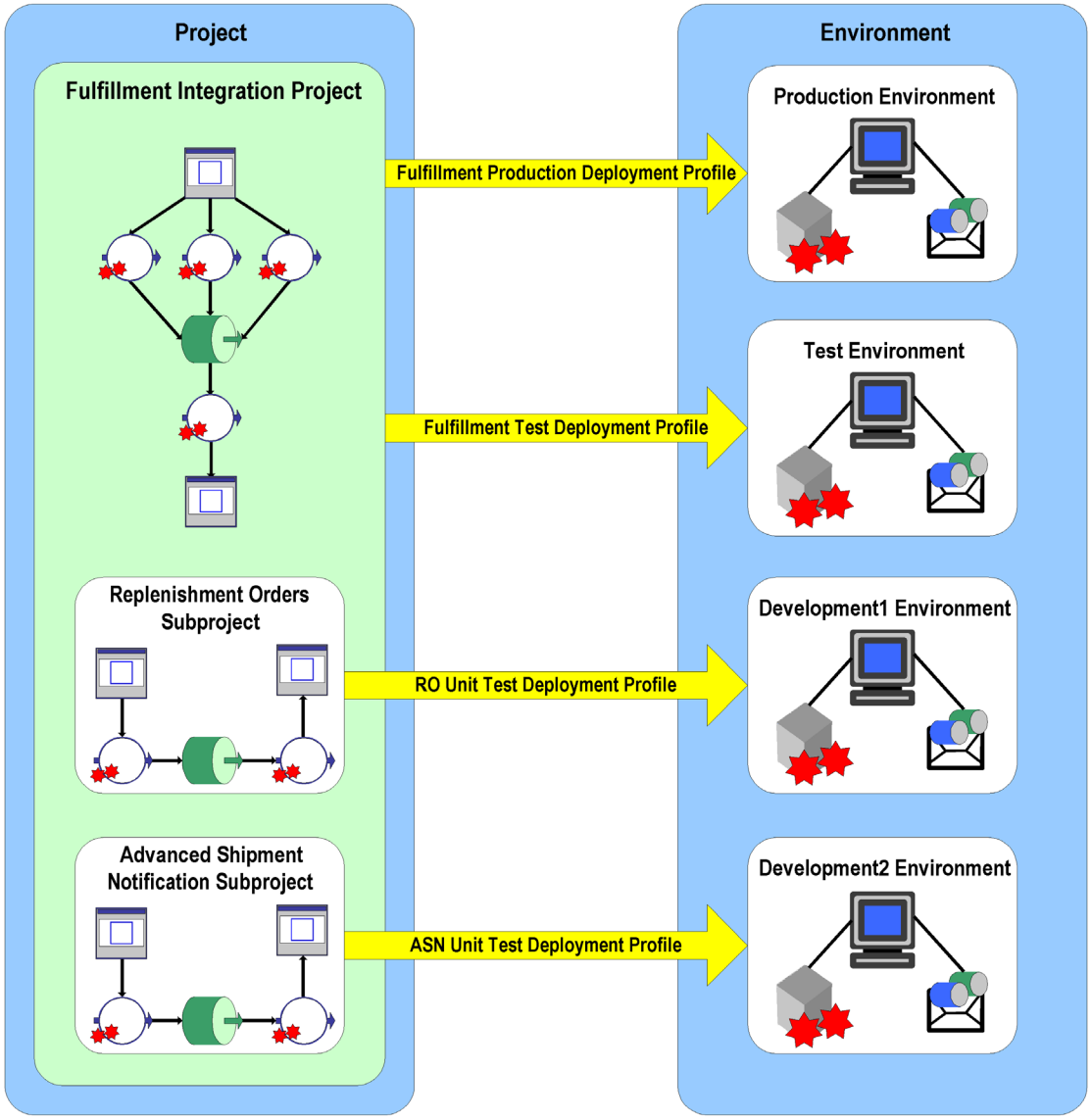
2.2.2 Enterprise Designer

The Enterprise Designer includes the following graphical user interfaces (GUIs) to assist you in the development of an eGate Project:

- Enterprise Explorer
- Connectivity Map
- Object Type Definition Wizards and Editor
- Collaboration Definition Wizards and Editors
- Deployment Window
- Environment Window
- Impact Analyzer
- Version Control

Refer to Figure 1 for an overview of the Project creation process. See the *eGate Integrator User's Guide* for more information about each GUI.

Figure 1 eGate Enterprise Designer Architecture



Chapter 3

Analysis and Planning

This chapter explains how to analyze your current business systems and processes in order to plan the optimum eGate design and deployment to meet your stated requirements.

In this chapter

3.1 Introduction: Analysis and Planning

Deploying eGate requires completion of the following phases:

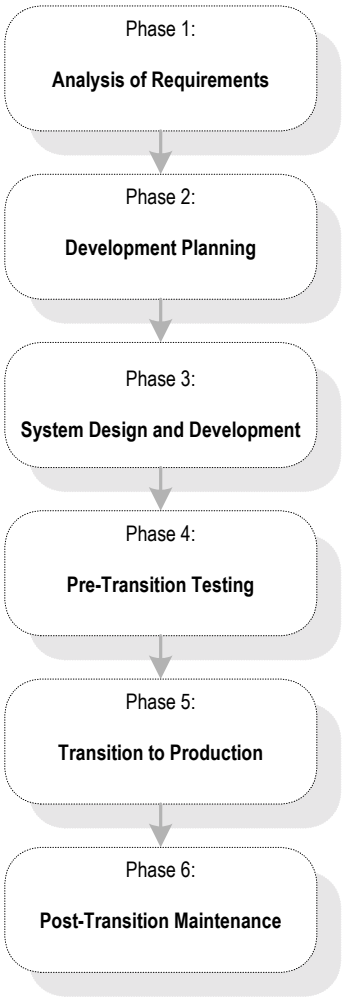
1. Analysis of requirements
2. Deployment planning
3. System design and development
4. Pre-transition testing
5. Transition to production
6. Post-transition maintenance

Figure 2 on page 13 shows a diagram of these six deployment phases. This chapter explains the first two phases, which are:

- **Analysis of requirements phase:** This deployment guide seeks to give you a road map of how to deploy eGate. First, to use a road map, you have to know where you are (analysis) and where you are going (planning). In other words, find out everything you can about your information system setup and business processes. Then, you can decide what information systems and business process needs you want eGate to meet.
- **Deployment planning phase:** Deployment begins when you plan out and schedule how, in view of your analysis information and allocated resources, you want to implement your eGate environment. During this phase, you set up the operation procedure and schedule for the entire deployment project.

The first two phases are the most important in the deployment project. This chapter discusses these phases in detail (later chapters treat the rest of the phases). Analysis and planning are information-gathering operations. Poor planning can cause serious problems during the later phases, but a good planning process can make system design and deployment easier, more efficient, and less costly. Thorough, comprehensive analysis and planning techniques lay a solid foundation for the entire deployment project.

Figure 2 eGate Deployment Phases



3.2 Gathering Information

You must prepare for your deployment project by gathering as much relevant information as possible. The more comprehensive your analysis and data are, the better. For best results, use the most modern survey and polling tools available to your organization to obtain the information you need, discarding unnecessary data.

Information-gathering Tools

Use the following tools to assemble your deployment research:

- Research and interviews
- Surveys

3.2.1 Research and Interviews

These methods are the time-honored, traditional ways of gathering information. Use them as diligently as a college student writing a term paper. Your company has reams of paper, cabinets full of files, and databases overflowing with useful information, from management directives to marketing papers to MIS memoranda. Much important deployment information exists here, provided that you make good use of it.

Interview and talk to the employees of your organization. Find out what they do and what their information systems needs are. Of course, input from relevant management and MIS people is necessary, but do not forget marketing employees, secretaries, and anyone else in touch with data flow needs. You want to put together a complete picture of your organization's current and future information systems/business process requirements.

SeeBeyond's Professional Services department can help you in answering specific questions on how to gather data and what kinds of data are relevant for your own deployment project. You can utilize this resource, as necessary.

3.2.2 Surveys

Formal surveys are excellent tools for getting information. Surveys allow you to organize your own thoughts and processes, as well as helping to gather the desired information from others. There is a lot of helpful literature available on creating, giving, and analyzing polls and surveys. Reading some of this literature can provide a helpful background for doing these tasks.

3.3 Analyzing Your Requirements

In gathering and analyzing information on your eGate needs, you must first know what kind of information you need. Remember that eGate links to your current networks, business systems, and applications together into a single, seamless information system. The purpose of this system is to facilitate your current and future business process needs. In other words, in as much detail as possible, find out where you are and what you need.

Examining Your Needs

During the analysis of requirements phase, you examine your needs and define the properties that the system must possess to meet those needs. Also, you identify system constraints and performance requirements. Define what functions you want the deployed system to perform but not how the functions work (this task happens during

the design and development phase; see **Chapter 5 "Designing and Developing the eGate Environment"**).

This section tells you what kinds of information you need to gather to facilitate your eGate deployment, by posing a series of relevant questions. Make sure you answer all these questions as thoroughly and correctly as possible and discard any information that does not help you in answering them.

These questions fall into the following general categories:

- System-specific
- Operation and performance
- Personnel and training
- Business planning

Keep in mind that examples given in this section are general and are only meant to start you thinking in the right direction. You must begin by assembling general information on your needs, categorize that information, and expand on it by filling in necessary details to fully explain each category. See **Chapter 5** for more detailed examples of specific information you must put together.

3.3.1 System-specific Needs

These needs are the basic information systems, network, and database-related requirements you want the eGate system to meet. Determine your system-specific needs by asking the following questions:

What existing systems do we need to connect?

Create a complete picture of your current information system setup. Include applications, networks, systems, platforms, and outside information pathways.

Example: An Intel PC LAN with Windows XP network connecting workgroups with office applications, a UNIX system with an Oracle database containing customer information, and an IBM OS/390 system with IMS tracking financial transactions.

How do we want to do the connecting?

Find out how you want your various systems to talk to each other (communication protocols), which systems must be linked, and the direction of communication.

Example: We have systems A, B, C, and D. Systems A and B use TCP/IP, C uses SNA, and D uses SAP. All systems must talk to each other except system D which only needs to communicate with A. All communication in all systems is two-way, except that system C only needs to receive information from the others and not send it.

What are our data requirements?

What types of data do you use, how much, and when?

Example: Our system uses HL7 and X12 data types. On average, our system needs to move about 100,000 messages per day at about 5 MB per message, with 90 percent of that data moving between 8 a.m. and 5 p.m. every Monday through Friday. Peak data loads are generally between 2 and 4 p.m. on weekdays (60 percent of volume).

What are our system/hardware limitations and constraints?

Installing eGate requires that you have the necessary hardware and operating system (OS) software and purchase (and install if necessary) additional hardware and software to contain eGate. Do you want UNIX or Windows? What is your budget for additional hardware and software? Do you have any space limitations in the area where this hardware will reside?

Example: We use Solaris UNIX servers for our large scale systems. We will need to plan to purchase Windows client PCs for each of our system developers who will be designing eGate Projects using the eGate Enterprise Designer.

Planning for hardware needs requires special considerations, for example, how many systems you need, memory (RAM) required, the number of CPUs you need, and total disk space. **Chapter 4** discusses in detail how to analyze and plan for these additional system requirements.

3.3.2 Operation and Performance Needs

Do you have any specific system operation and performance issues? Now is the time to discover, organize, and itemize them by asking the following questions:

What are our system performance requirements?

Ultimate system performance comes down to a trade-off between speed and maintainability. This fact is true overall, as well as being true for the operation of individual system component operations. You must prioritize these needs specifically.

Example: Customer databases must be totally accurate and detailed because the information is often used and vital to the company. Detailed maintenance of this data is more important than speed of processing. However, our moment-by-moment stock quotations have to be fast and up-to-the minute. Maintainability here is negligible because this data changes so fast that long-term retrieval is not an issue.

What are our internal security requirements?

eGate has access security, that is, special features allowing only certain persons to log on to the system and different persons to have specific privileges after the log on.

Example: The company only allows five people to log on to the system: one with system administrator privileges, two with operator privileges, and two with monitor privileges.

What are our error-handling and data validation requirements?

How, when, and where in the system does the customer require data to be error checked and validated? Keep in mind that processing speed decreases as checking instances and the detail of error checking increases.

Example: All data passing through our eGate must be validated to the most thorough extent possible. To facilitate this process, we compiled a complete list of all different data types that require validation.

3.3.3 Personnel and Training Needs

Deploying eGate may require some expanded personnel needs, so you must consider the following questions:

Do we have personnel trained and able to deploy the system?

Deploying eGate does require some training of current personnel and may require the hiring of additional persons, depending on the size of the system you are planning and implementing. The use of SeeBeyond Professional Services staff can often be the most cost effective way to deploy your eGate implementation.

Example: We need two resources to deploy and later operate the new system. One new person must be hired. All three must attend the basic eGate class and introduction to Java class (both offered by SeeBeyond) and one must attend the basic and the advanced class. The new hire must be thoroughly trained in UNIX (not offered by SeeBeyond).

Do we have personnel trained and able to maintain the system after deployment?

Post-transition maintenance of eGate may also require additional personnel and training.

Example: In addition to personnel hired to deploy the system, we must train one additional resource for long-term system maintenance.

3.3.4 Business Planning Needs

eGate can help you facilitate and improve your overall business processes. Assess your needs in these areas by asking the following questions:

What are our record-keeping and documentation needs?

Make sure you set up a system for documenting your eGate operation.

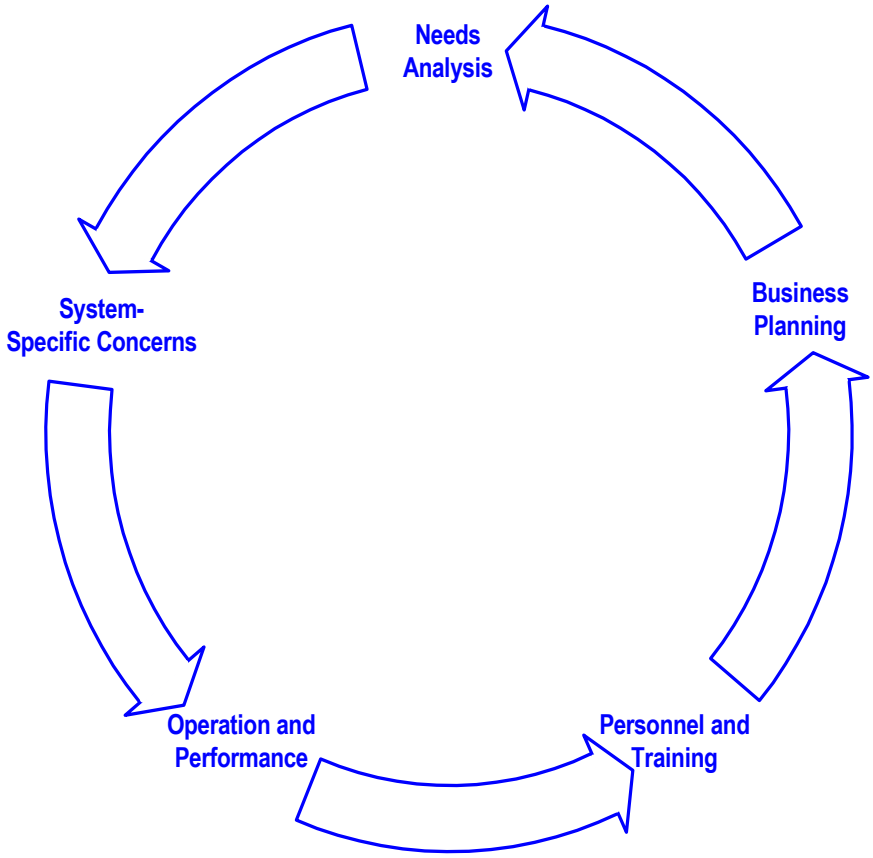
Example: We must put a new methodology in place to document and diagram the total operation of eGate. In addition we must keep complete records on that operation.

How do we create a deployment road map?

Plan your deployment well. Choose a deployment project team (for a small deployment, one person could do this task) to carry out the project, and make sure you document your plan in writing. Flowcharts and system diagrams are definitely helpful (see **"Planning Your Deployment" on page 18**).

Example: Figure 3 shows a diagram of the information-gathering cycle in the deployment project's analysis of requirements phase.

Figure 3 Analysis of Requirements Phase/Information-Gathering Cycle



As you continue the analysis process, allow the results to feed back into your overall analysis. If necessary, repeat the process to fine-tune the information you have gathered. This method allows you to ensure the accuracy and usability of the requirements you collect.

Once we have the information, what do we do with it?

Complete the process of documenting and organizing your information as correctly and comprehensively as possible. When you are finished with the analysis of requirements phase, you use this information to help you with the next phase, planning your eGate deployment project.

3.4 Planning Your Deployment

The deployment planning phase is the next major step in your eGate deployment project. In planning your deployment, you create a road map of what that deployment will look like. You must include criteria like resources, schedules, goals, and objectives.

The primary purpose of this phase is to initiate the project, define the integrated system to be developed, create top-level design documents, and create a formal project plan or road map.

In creating your deployment road map, you provide a detailed description of the integrated eGate to be developed. This plan serves the following primary purposes:

- Designing what your future system looks like
- Showing you the resource allocation needed to implement the design

If analysis is finding out where you are, planning tells you where you want to go and how to get there. You can obtain help, when necessary, from SeeBeyond's Professional Services and other SeeBeyond representatives. Thorough and comprehensive planning helps to ensure a smooth-running and satisfactory deployment project.

The major steps in deployment planning are:

- Setting up overall objectives
- Identifying and scheduling tasks
- Determining when objectives are met

3.4.1 Setting Up Overall Objectives

This step of the deployment planning phase entails the following operations:

1. Achieve a consensus on the implemented eGate's overall functionality and scope by taking the following steps:
   - Set up organized technical and functional teams or roles to handle individual phases and aspects of the deployment.

Note: *For a small deployment, one person could handle the tasks of a team.*

   - Ensure that the system's functionality is clearly stated and agreed upon.
   - Document the functionality and scope of the project based on analysis information, as well as match this information against the scope of the project as stated in the "Approved Proposal."
   - Resolve any differences between the "Approved Proposal" scope and your prepared analysis and requirements information (see **"Analyzing Your Requirements" on page 14**), if necessary.
2. Create a general model of what the system will do. This model serves the following purposes:
   - Serves as the foundation architectural plan for all eGate design (see **Chapter 5 "Designing and Developing the eGate Environment"**).
   - Consists of diagrams and supporting documentation that represents the design strategy for any required eGate interfaces.
3. Set up a design and development team or role and provide this team with an understanding of the application domain. Also provide them with approved, clearly stated, top-level design documentation of requirements for eGate domain.

4 At this point, the groups and persons meeting together must formulate a basis of validation of the final product during acceptance testing (see **Chapter 6 "Testing, Transition to Production, and Maintenance"**). This validation process includes the testing required to validate the functionality of the system and that it works as stated in the "Approved Proposal."

3.4.2 Identifying and Scheduling Tasks

This step of the deployment planning phase includes:

- Deployment initiation steps
- Creation of deployment documents

Beginning Deployment

Begin the deployment project via the following actions:

- **Hold a Project Kick-off Meeting:** This meeting identifies all members of the deployment project team. The analysis tasks and responsibilities assigned to each resource will also be identified. The purpose of this task is to outline the reporting structure for the project and identify whom the Project Manager communicates with to ensure that other tasks in the project are being completed as planned. In addition, documentation standards and the project reporting structure are established at this time.
- **Ensure Software and Hardware Installation:** The purpose of this task is to ensure that your hardware and software is in place and ready for eGate installation. This process includes ensuring that eGate software is fully supported on your hardware platform and operating system and that the software has been shipped.
- **Complete Installation Test, Installation, and Checklist:** eGate installation task is completed during the deployment planning phase to ensure there are no issues with your technical environment. You can use a deployment checklist to detail the exact hardware and operating systems where the installation will be performed. This task includes the following steps:
  - The total eGate environment must be installed and tested. The deployment checklist is updated to identify what items were completed and document outstanding issues that may have kept any items from being completed.
  - The production, training, and test (pre-production) hardware, software and network requirements (current and planned) are identified and verified.
  - The end-to-end communications with your other systems are also tested to ensure that communications are set up correctly and systems are exchanging messages correctly according to the communication protocol being invoked.
  - Any communications with other businesses or trading partners are tested in the same way.
- **Establish the Change Management Process:** A critical factor through all phases of the project is change management. Change management identifies and track all changes for a project that depart from the original deployment plan. All changes

must be identified and tracked because many small changes can and will impact a deployment project in the same way as a more easily identifiable large-scale change. Tracking all changes allows the project manager to plan and control a project and keep track of all changes in the project's scope.

Deployment Documents

You must document the deployment project. This step requires that you create the following documents:

- **Preparing the Deployment Project Plan:** This document lists a set of tasks for establishing a baseline reference plan. It is your road map for the deployment project. The roles and responsibilities of each organization, schedule of tasks, and any estimates must be defined in this plan.

  It is best that this plan be as detailed as possible. Any project risks must be assessed and documented. Your necessary resources are budgeted using this plan (or validated if you have already created a budget).

  The deployment project plan must be reviewed and agreed on by all the organizations involved in the project. It must be communicated to all affected organizations. The following table shows a list of the subject matter the plan must contain.

Table 2 Deployment Project Plan

Contents	Description/Methods
Scope of work	This item must be based on the purchase contract, "Approved Proposal," or any equivalent document.
Project organization	Include the deployment project team (or the person responsible for a small deployment), development organization, review organization and any external organizations involved in the project. The roles and responsibilities must be clearly defined.
Delivery schedule	Indicate the schedules for all specified eGate deliverables, including the final delivery date after all validation and verification tasks are complete.
Estimates	This section includes a work breakdown structure (WBS).
Overall schedule	This section contains a schedule for all deployment project tasks including resource assignments; key phase completion milestones must be indicated. This schedule will be further elaborated by developing various phase work plans (the use of Microsoft Project is recommended).
Resource requirements	Include the manpower, hardware, and software resources required for the testing phase before transition to production.
Issues and risks	Potential project issues and risks must be identified, and contingency plans must be drawn up for any risks.

Table 2 Deployment Project Plan (Continued)

Contents	Description/Methods
Organizational interfaces	The dependencies on other projects and information needed from other organizations must be clearly identified, documented, and conveyed to any affected parties.

- **Functional Requirements Specification:** In creating this document, you identify and analyze your specific system requirements. The behavior of the various application components (messages, process, and associated data) are carefully analyzed and documented. You must check and verify each of these components.

  The functional requirements specification, along with technical requirements specification, helps form the basis for system design and final project acceptance. The typical subtasks in creating this document are:

  - Studying and identifying system requirements to derive the business process functionality required and identify the system architecture needed to meet functional requirements.
  - Creating eGate architecture model to show the proposed integrated system.
  - Creating eGate interface models to define interface requirements.
  - Being sure that, at every step in its creation, you are allowed to review, give input to, and sign off on this document. The following table shows a list of this document's contents.

Table 3 Functional Requirements Specification

Contents	Description/Methods
Statement of requirements	Define the objectives you want eGate to meet.
Proposed eGate architecture	Show a summary design model of the sending and receiving systems, eWay Intelligent Adapters to be used, and interfaces that take place.
Proposed directory structure and messages that trigger eGate processing	Provide a map of the external sending/receiving systems, directory structures, and the business/processing messages, including what eGate processing will be initiated by the messages.
Exception processing	Define requirements for processing errors or exceptions.
Constraints	Define data volumes, performance, and any backup/archive requirements.
Interface diagrams	Produce a diagram for each proposed interface, showing the sending/receiving system, message processing, and any interdependencies.
Hardware/software diagrams	Show the hardware/software environment and high-level related schematics for development, testing, and production systems.

The general design model provided by this document forms the starting basis of the next deployment step, the system design and development phase. See **Chapter 5** for details on how to use this model as the foundation for your complete eGate architecture.

- **Technical Requirements Specification:** In creating this document, you identify and analyze your specific technical requirements. The behavior of the various application components (messages, process, and associated data) are carefully analyzed and documented.

  Of course, you have input on and verify the need for each of these components. This technical requirements specification, along with the functional requirements specification, helps form the basis for system design and final project acceptance. The typical subtasks in creating this document are:

  - Creating a hardware/software model to define the environment that eGate will process in.
  - Being sure that, at every step in its creation, you are allowed to review, give input to, and sign off on this document. The following table shows a list of this document's contents.

Table 4 Technical Requirements Specification

Contents	Description/Methods
Technical requirements specification	Requirements for security, system availability, and the technology being used to meet these requirements.
	Any additional related requirements.

- **Test Plan Requirements Specification Document:** A high-level test plan must be produced, highlighting the testing tasks to be performed during each phase. This document specifies the test approach, the type of tests to be carried out, and the organization responsible to carry out the tests for each test phase.

Important: *A detailed test plan is developed during the design phase (see* **Chapter 5***). The actual testing is carried out during the testing phase before transition to production (see* **Chapter 6***).*

The test plan requirements specification can be a single document, or it can consist of a separate document per project for all the test phases, or one document per phase, depending on the size and complexity of the deployment project. Table 5 shows a list of this document's contents.

Table 5 Test Plan Requirements Specification

Contents	Description/Methods
Test plan	Contains a general description of the testing phase of the deployment project; this plan is preferably produced by an independent test team or role based on your requirements for the testing of applications and their process for promoting applications to production.
Test phases	Includes the programmer test, unit test, integration test, system test, roll-out test, operation readiness test, and so on.
Test approach	Details whether there will be manual or automated testing and the validation process for each test performed.
Organization	Includes the testing team or role (functional and technical).
Schedule	Defines the system availability for test data and system resources needed for the different test phases.
Resource requirements	Defines system, individual, and team resources needed for the test phases.

Chapter 6 contains a complete description of the testing, transition to production, and post-transition maintenance phases of the deployment project.

Note: *The tasks stated in this guide walk through the steps required for developing and delivering eGate implementations. This document addresses these implementations as total systems, and so presents the deployment planning phase as being completed before the system design and development phase. In an actual deployment, there is probably overlap between the two phases. This fact, of course, applies to all phases.*

3.4.3 Determining When Objectives Are Met

All deployment planning phase objectives have been met when the following steps are completed:

1 The deployment project is successfully initiated, including the following completed tasks:

- Your deployment project team and design and development team are set up, and their assignments and responsibilities are identified.

  For a small deployment, one person could substitute for each of these teams.

- The deployment checklist is completed.
- The prerequisite hardware and software has been identified, installed, and tested.
- A working change management process is established.

2 The deployment project plan has been completed, updated (if necessary), and approved by deployment project leadership and your management.

3 The functional, technical, and test plan requirements specifications are completed and approved by deployment project leadership and your management.

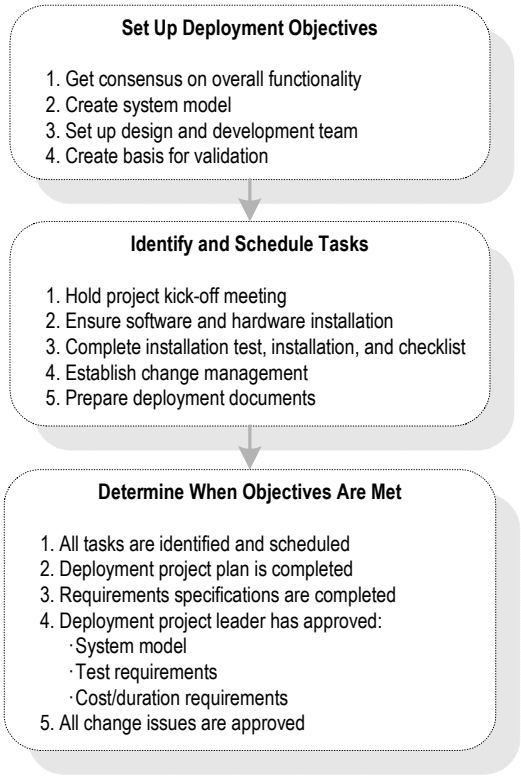
4 The deployment project leadership must review and approve the following requirements:

- Architecture design documents must be completed and approved.
- Test requirements must be identified, documented, and approved.
- All analysis information must be verified as detailed and accurate enough to predict the deployment's cost and duration.

5 Any subsequent issues resulting in a change of the project scope and resources must be communicated and signed off, including approval by deployment project leadership and your management.

The following figure shows a complete diagram of the steps of the deployment planning phase, as discussed in this section.

Figure 4 Deployment Planning Phase Steps



Moving Forward

Once all the members of your management and deployment project team (or other responsible persons) agree that these objectives have been met, you have successfully finished the deployment planning phase of your eGate deployment. You have already

created a complete deployment road map, the "deployment project plan," along with some general designs for your completed system.

The rest of the chapters in this guide treat eGate deployment project under the following topics:

- **Hardware Needs:** An important part of planning for your system and deployment is how to determine your hardware requirements. If you need additional information on planning for and determining your system's hardware requirements, see **Chapter 4**.
- **System Design:** For a discussion of the next phase of your deployment project, including system design architecture and development, see **Chapter 5**. In this phase, you broaden and fill in the details of the general designs you created during planning.
- **Testing and Transition to Production:** For a discussion of the testing, transition (go-live), and maintenance (fine-tuning) phases of your system deployment, see **Chapter 6**. These phases follow the system design and development phase.

Chapter 4

Determining System Requirements

This chapter offers guidelines to help you determine the system requirements for the deployment of eGate.

In this chapter

4.1 Introduction: System Requirements

This chapter explains how to assess your needs for the following types of hardware:

- CPUs
- Hard disk space
- Random access memory (RAM)

There are many variables and factors to consider in order to adequately determine the hardware requirements for your particular system. As such, this discussion will be limited to issues as they relate directly to eGate.

This chapter does not consider networking topology, and does not address such issues as shared applications, how resources are distributed throughout a network, and how many workstations are included in the network. Furthermore, in the case of databases, it is assumed that each database management system is installed on a separate host. See **Chapter 5** for details on these considerations.

4.2 Initial Considerations

eGate merges traditional Enterprise Application Integration (EAI) and Business-to-Business (B2B) interactions into a multi-enterprise eBusiness system.

Depending on the number of external connections, the type of data being processed, and how the data is processed, the required resources can vary. Take the following points into account as you begin estimating your hardware requirements:

- Each eGate deployment is different. Obviously, this is true when custom systems and enhancements to existing systems are present. The configuration of each deployment is unique because there are varying numbers of components as well as variances in interconnectivity. Some components are bidirectional and complex, while others merely pass data through.
- In addition to differences in configuration, the computational requirements will differ both in scope and complexity. The high-performance architecture of eGate is net-centric, not server-centric, not client-centric, and not hub-based, which makes eGate highly flexible. It is this flexibility that makes predicting the general requirements of hardware a complex task.
- An eGate solution is distributed via run-time components and is platform-independent. System stability and redundancy are important considerations. Server requirements vary greatly, depending on the components resident on the server, the archiving requirements configured on the customer's system, and other factors.
- Instead of only referring to absolute minimum requirements, it is more meaningful to discuss the hardware needs of an installation in terms of recommendations. By using the methods set forth in this chapter, a system analyst can estimate the required resources for a given configuration, from a simple deployment to a complex deployment, and thereby define an initial recommendation. Once installed, eGate can be fine-tuned, both in terms of hardware and software, to optimize performance.

4.3 Estimating Requirements

eGate has been deployed in an extremely wide variety of environments, from simple deployments of a single system with a single CPU to highly sophisticated configurations consisting of 64 CPUs that process one billion transactions per day.

4.3.1 Consideration Factors

Because eGate is a general-purpose toolkit that is completely flexible in its deployment and configuration, estimating the processor requirements is a challenge. There are infinite possibilities and numerous factors with complex interactions that affect the estimations. Some of the factors are more critical than others, depending on the circumstances.

For example, the effect of limited RAM resources that create a paging/swapping situation could completely hide the effects of a complex OTD or a poorly written Collaboration. Some of the factors that affect performance in eGate are:

- CPU type and architecture
- CPU speed

- Presence of a CPU cache and its size
- Number of CPUs
- Physical memory size
- Swap size
- Disk subsystem, that is, bandwidth, latency, block size, RPM, seek time, and the presence and size of the cache
- Network bandwidth and load
- Number of external systems and their latencies in servicing messages and acknowledgements
- Complexity and amount of processing to be performed by each component
- Message volume, size, and distribution through the day
- Throughput and response-time requirements
- Complexity of messages, including the number of nodes and complexity of regular expressions
- Bundling of messages, that is, more than one logical record in one physical record
- Number of transitions between components for a given message (for example, moving data from an eWay to a topic/queue to an eWay or Collaboration)
- Amount of the implementation that can utilize parallel processing
- Other loads on the Logical Hosts (for example, queue cleanup schedules, backups, and other processes)
- Dispersion of solution across multiple CPUs and systems
- Number and architecture of eGate subcomponents participating in the Project

Not only are there more factors, but these factors need to be assessed for each Logical Host in a distributed eGate deployment.

4.3.2 General Guidelines

There is no standard benchmark in the EAI industry like there is in the Database Management System (DBMS) industry, that is, the Transaction Processing Performance Council (TPC) benchmark. It is debatable whether a benchmark can ever be developed, which could accurately and reliably predict the processing requirement for a given integration implementation. This difficulty results from the number and complexity of factors that could affect performance. The resulting equation would be impractical to use because of the large number of parameters and their weights.

Because there are many areas in which the architecture can be tuned to achieve further performance gains, each time a new change is made, the performance characteristics may be different. Another problem is that any benchmarking equation would rely on other measures that are just as problematic, for example, measuring program complexity, lines of code (LOCs), or function points (FPs).

Pragmatic Approach

A more pragmatic approach is to start with a good base configuration as a development system and use that configuration to predict the processor requirements for a production system for your unique implementation. The minimum hardware requirements for a typical eGate configuration of 20 interfaces would be one of the following systems:

- Windows 2000/XP system running on dual Pentium 4-class 866-MHz CPUs
- eGate-supported UNIX system running on two 800MHz-to-2-GHz CPUs
- Both of the above requirements with 1 GB of RAM and 20 GB of hard disk space, preferably in a hardware chassis that supports more than two CPUs

The recommended methodology is to implement a representative number of interfaces (that exercise a good sample of the various data transformations and communication requirements of the implementation) on this system, run representative data files through the system, and record the CPU load. From these measures, you can project what the final production load will be and therefore the CPU requirement. Of course, the architecture can be tuned to achieve more efficiency using this same technique.

One of the advantages of eGate's distributed-and-scalable architecture is that hardware does not need to be replaced but can be included in a multi-system implementation. Therefore, as processing requirements grow, you can easily add new hardware.

Factors to Consider

When estimating resource requirements, certain general considerations exist. These factors fall into three usage categories: disk space, RAM, and CPU. The table below lists these considerations for the Repository, Logical Host, and GUI machines.

Table 6 Resource Considerations

Machine Role	Active Module(s)	Resource	Consideration
Repository	▪ SeeBeyond Repository Server	Disk Space	The disk space usage increases as additional ICAN products are installed.
		RAM	Memory usage increases with each additional client connection. Every Logical Host and GUI host connection uses RAM resources on the Repository machine.

Table 6 Resource Considerations (Continued)

Machine Role	Active Module(s)	Resource	Consideration
Logical Host	▪ Bootstrap ▪ Management Agent ▪ Integration Server ▪ JMS IQ Manager	Disk Space	Disk resources are only used by the products configured on a given Logical Host. A Logical Host running only one component will use less disk space than a host that contains multiple configured products.
		RAM	Memory usage increases when: ▪ The number of Collaborations and other modules increases. ▪ The size and complexity of messages increases.
GUI (development) machine	▪ Enterprise Designer	Disk Space	The disk space usage increases as additional ICAN products are installed.
		RAM	Memory usage increases based on the number of products being configured.

Minimum System Requirements

The **Readme.txt** file on the eGate installation CD-ROM contains the most up-to-date system requirements.

To use eGate, as a *minimum*, you must have the following:

Table 7 Minimum System Requirements for Windows

Machine Role	Disk Space	RAM	CPU
Repository	20 GB	1 GB	850 MHz Pentium III class. (Multiple CPUs recommended).
Logical Host	500 MB	1 GB	850 MHz Pentium III class
GUI Host	500 MB	512 MB	850 MHz Pentium III class.

Note: *Refer to the readme.txt file for the minimum system requirements for UNIX systems.*

4.4 System Requirements: Summary

This section summarizes eGate deployment system requirements.

Going Forward

Once you have finished all elements of your deployment planning, including having a complete determination of your hardware requirements, you are ready to go on to the system design and development phase of the project.

The next chapters in this guide treat eGate deployment project under the following topics:

- **System Design and Development:** For a discussion of the next phase your deployment project, including system design architecture and development, see **Chapter 5**. In this phase, you broaden and fill in the details of the general designs and overall model you created during planning.
- **Testing and Transition to Production:** For a discussion of the testing, transition (go-live), and maintenance (fine-tuning) phases of your system deployment, see **Chapter 6**. These phases follow the system design and development phase.

Chapter 5

Designing and Developing the eGate Environment

This chapter explains how to design and develop a complete, functioning eGate based on your deployment analysis and planning.

In this chapter

5.1 An Overview of eGate Design

After the analysis and planning phase has been completed, your next major step is the system design and development phase. In many ways, this work is the heart of eGate deployment operation. During this phase, you flesh out the essential system architecture that implements your business plans and processes.

Designing the deployment of eGate environment requires a series of successive refinements applied to your initial summary plan ("Functional Requirements Specification" document as outlined in **Table 3 on page 22**). Your design must start with the broadest view of the system then proceed to the details.

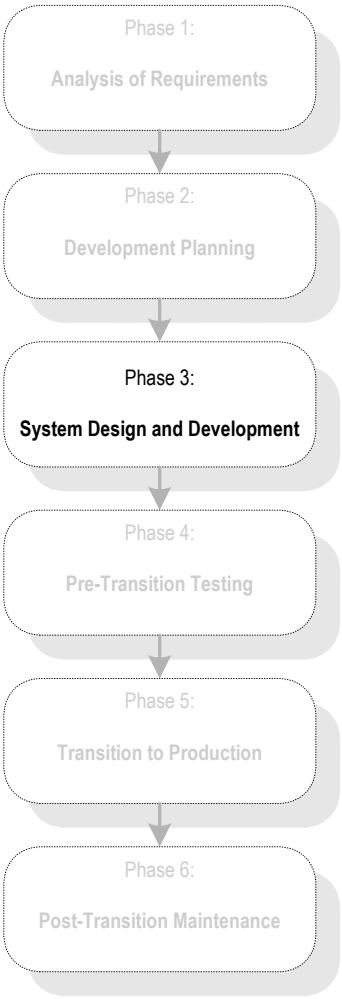
Applying this top-down approach to deploying eGate environment results in the most effective application of its technology to the integration of your existing systems and applications. Total system design and development include the following basic steps:

- Planning general hardware configuration
- System design methodology
- Software installation and development
- System optimization

However, keep in mind that these steps are not necessarily an exact sequence. The entire design and development operation requires that you occasionally "back-track" to earlier steps and look forward to later steps, to implement the correct design refinements your system requires.

Figure 5 shows where the system design and development phase fits into the overall eGate Deployment operation.

Figure 5 System Design and Development Phase



System Design

Because you can distribute a single eGate system over as many hosts as you need to provide sufficient computing power, this chapter guides the decisions you must make to deploy an effective eGate environment, including:

- Choice of the number of hosts to employ
- Choice of the number and types of Projects and components to build

The chapter also presents a methodology for designing an eGate environment. The methodology involves the following well-defined steps:

- Describing the communication topology
- Designing the hardware topology
- Designing the component topology
- Planning eGate components

- System optimization

System Development

Development proceeds after completion of design tasks and consists of a list of tasks to create each component of eGate. The section on development explains how you create the task list, including the completion order for the tasks.

5.2 Distributed Architecture Considerations

The power of eGate lies in its fundamental design that includes:

- Distributed architecture
- Central management of computing

This section explains eGate's distributed network architecture and how to take advantage of its specific features in your deployment.

5.2.1 Distributed Architecture in eGate: Overview

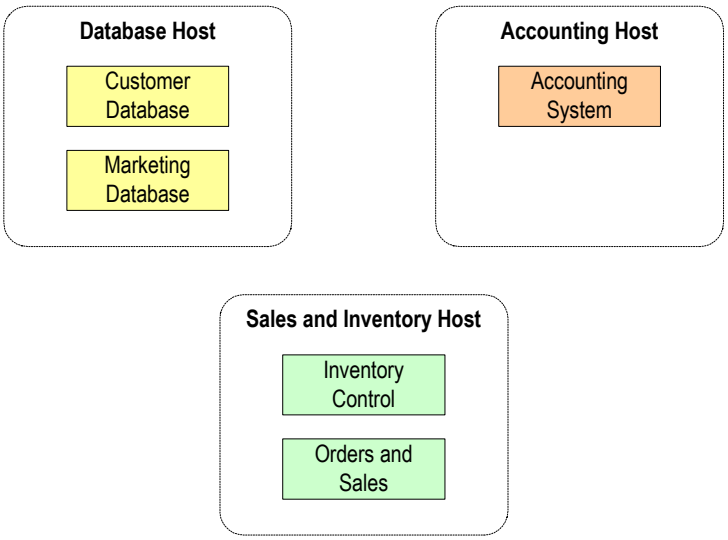
A common view of software systems starts with a box representing a computer host. Programs or processes are added to the computer host and are represented as smaller boxes inside the bigger box.

Multiple software systems are typically spread out over several physical hosts with no relationship or connection between the hosts. Figure 6 shows the conceptual relationship among several different software systems that are commonly built to support business needs.

While it is possible to connect many different types of systems such as those in Figure 6, it is inconvenient and costly to manage the connections without a central point of access.

In addition, economies of scale gained through reusable components are unlikely to exist in the typical hub-and-spoke architecture that these types of systems require.

Figure 6 Common View of Software Systems



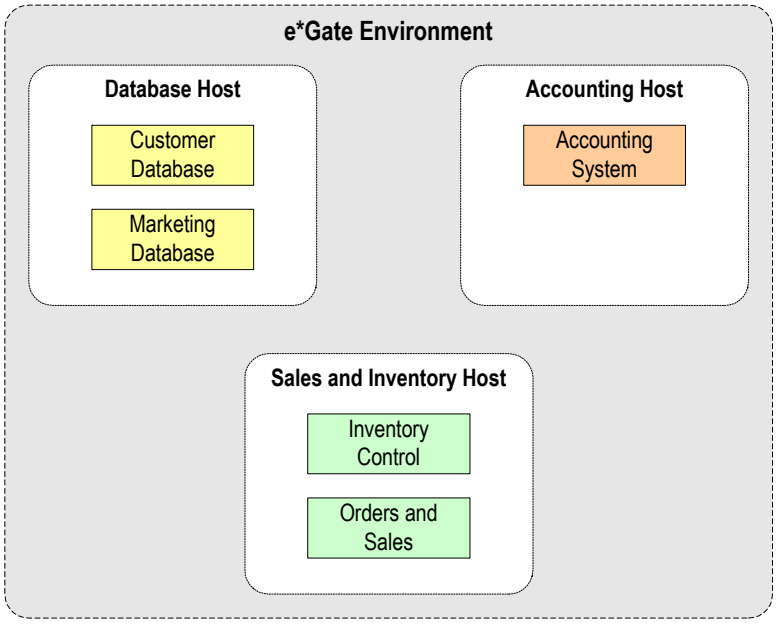
eGate turns this typical view around. eGate can be understood as encompassing all participating computer hosts. From this viewpoint, eGate becomes the connection that brings many disparate computer hosts and processes together.

As a result, diagrams describing a deployment of eGate show the system as a large box encompassing the systems that it connects.

Although eGate is represented as a large box, this portrayal is not meant to suggest that the system runs on its own dedicated host. The power of eGate is that its components can be distributed over several hosts as needed. The components communicate with each other and with a GUI that provides a central point of access to an integrated system.

Using the eGate environment as an example, Figure 7 shows computer hosts connected through eGate as boxes *inside* the main box.

Figure 7 eGate Distributed Environment



Multiple Logical Hosts

In eGate, the various components are managed in this distributed-network environment. All system components have logical names that are independent of physical host (computer) location. At the configuration level, the system's publish-and-subscribe information is dependent on logical names, not host names.

Logical Hosts have one property that sets the host name. eGate components find each other purely through host names and port numbers. As a result, it is easy to reassign host names or ports, or move eGate components to other systems without any change to the basic eGate configuration.

5.2.2 Basic Architecture

You can scale an existing eGate environment containing eGate simply by adding more memory, processors, and computer hosts to the total system. Any of these actions results in incremental benefits. Two examples are:

- If your company acquires a new business unit and needs to integrate its systems to an existing configuration, you network these systems to the existing eGate hosts and add new components to service the acquired systems.
- If your business experiences growth in computer traffic, and you need more computing power to service it, you can add another processor to an existing host. Also, you can add one or more hosts then move or duplicate some of the existing components to any new host.

In both of the previous examples, the existing eGate components do not change.

For example, you can configure Logical Hosts to refer to *any* Repository as your installation requires. Also, you can point multiple Logical Hosts to the same Repository.

Project and Component Organization

eGate components are organized into Projects. A Project is a configuration scheme that contains all the modules and configuration parameters that control, route, and transform data as it travels through the overall system.

A Project also maintains the relationships between its internal components, including the publish/subscribe information that is at the heart of eGate's data transportation process.

The number, design, location, and component makeup of your Projects is a function of your overall design methodology, as explained under **"Methodology Considerations" on page 38**.

5.3 Methodology Considerations

Methodology means the ways or methods to figure out how to design eGate to best meet your business and information system needs.

5.3.1 What is Topology?

Topology refers to the pattern of connections between interrelated objects. Topology considers only relationships between objects and ignores the location of the objects.

Because eGate is centrally managed, the location of a Logical Host is insignificant in designing the system. Understanding the meaning of topology is important in providing a conceptual framework for discussing design considerations for your total system.

Elements of Topology

A topology exists between the following elements:

Computer Systems Related by Communication
This is a data-flow topology because the only concern is which system is communicating with which other system. Communications topology is therefore only logical because it has no reality in hardware.

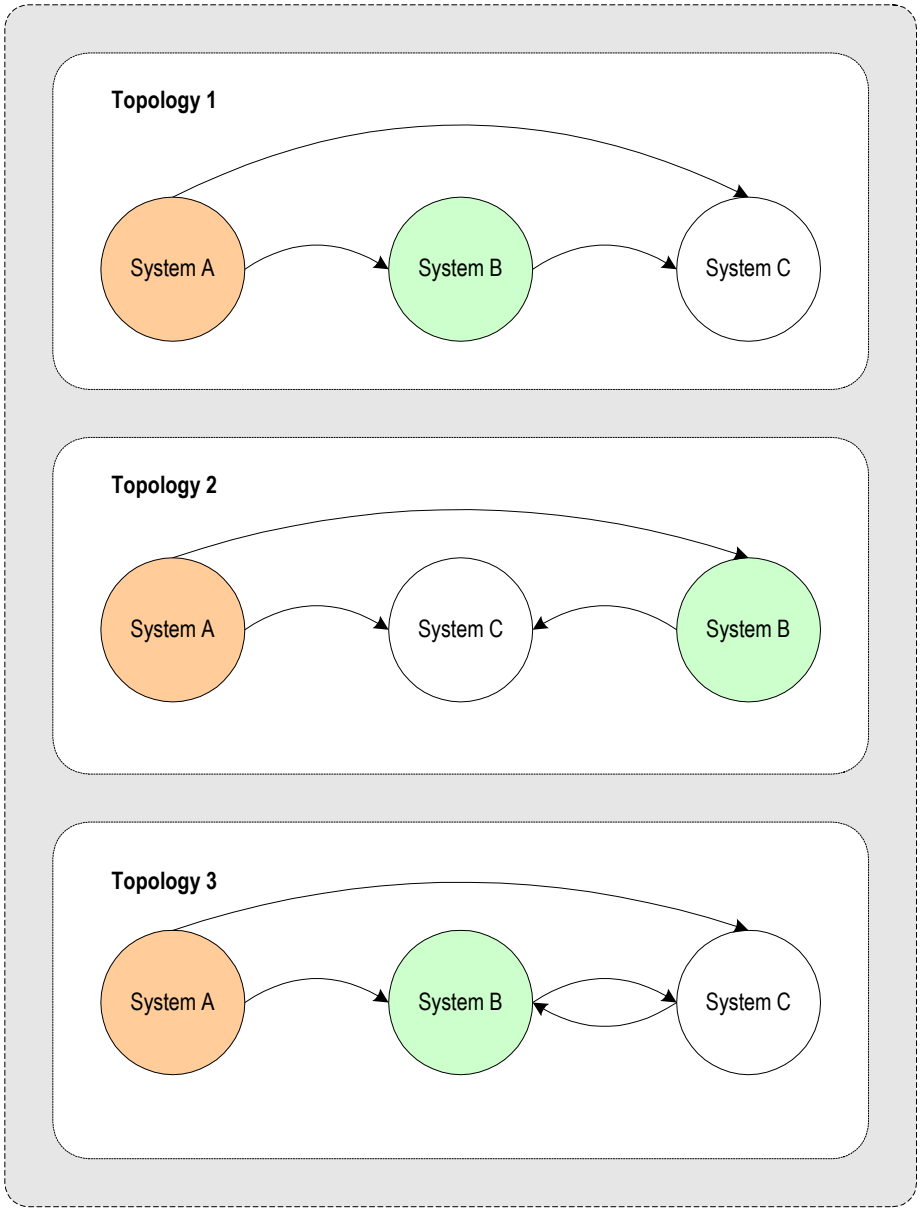
Computer Hosts Related by Physical Network Connections
This is a hardware topology because it concerns the relationship between physical computer hosts.

eGate Components Related by Publication and Subscription
This is a component topology because it concerns the pub/sub relationship between components.

Sample Topologies

The figure on this page shows three sample topologies. The first two examples are identical because distance and location are irrelevant in describing a topology. Only relationships matter and the relationships described by the arrows connect the same systems in the same way between the first two examples. The third example is different from the first two because it contains an additional connection from System C to System B.

Figure 8 Examples of Topologies



In these diagrams, the direction in which each external system exchanges data with another is identified with an arrow connecting the data publisher to the data subscriber (see the previous figure). The arrow points in the direction that data flows.

5.3.2 Three Basic Steps

The basic steps in designing eGate are:

- Identify all external systems to be connected.
- Define the configuration of eGate components.
- Define the configuration of hardware and network connections.

This section explains these steps in detail.

Identifying External Systems

The first step in designing eGate is to identify all the external systems to be connected to each other through the system. The resulting set of interconnected systems is called the *communication topology*. The communication topology exists without regard for the hardware hosts where components execute and without regard for the format of data exchanged between systems.

Configuring eGate Components

The second step is to define a configuration of eGate components, for example, eWay Intelligent Adapters, Collaborations, and Message Servers, to run on the respective hosts in the *hardware topology*. The component arrangement is called the *component topology*.

Efficiencies at this stage are gained by choosing the simplest OTDs and Collaborations. Defining the most efficient component topology depends upon the relationship of data formats. Therefore, defining object types is an integral part of designing the component topology.

Hardware and Network Connections

The third step is to define a configuration of hardware and network connections that enable the external systems to communicate as required by the communications topology. This hardware configuration is called the *hardware topology*.

As explained earlier, eGate is designed to run as a distributed system with central management. Only network performance and the demands on each host are relevant considerations in defining hardware topology. Because of the distributed architecture of the total system, the hardware topology is not rigidly defined. It can be adjusted as needed when system demands change. For example, increased demands on the eGate environment can be met by distributing processing across more CPUs.

For more information on how to determine and meet your hardware requirements, see **Chapter 4**.

Chapter 6

Testing, Transition to Production, and Maintenance

This chapter explains the transition-to-production phase of eGate deployment, including how to perform pre-transition testing, the transition operation, and post-transition maintenance procedures.

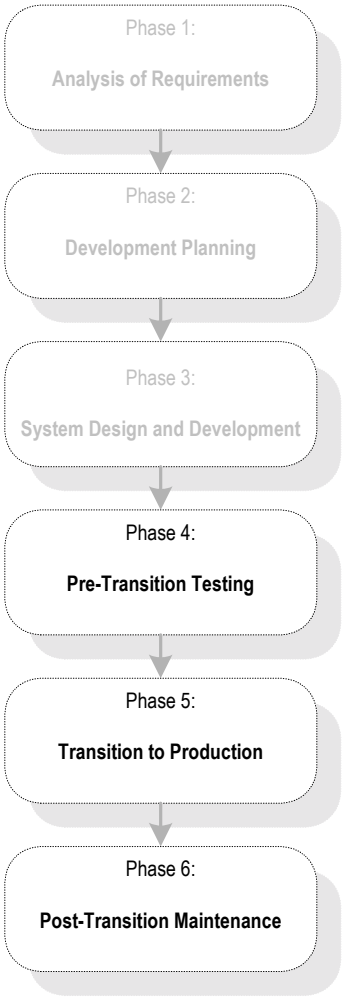
In this chapter

6.1 Introduction: Transition to Production

After the analysis, planning, and design/development have been completed, there are three remaining deployment phases. **Figure 9 on page 42** shows a diagram of the six deployment phases. This chapter explains these remaining three phases:

- **Pre-transition testing:** It is crucial to the success of a project to fully test the system prior to transitioning from a lab to a production environment. This testing phase includes unit testing, system testing, and performance testing. This chapter explains the possible methods of testing an eGate system in the lab.
- **Transition to production:** After the system is fully tested, it must be transitioned, or migrated, from the lab to its ultimate production environment. This chapter covers the procedures and considerations for performing the transition to production. Another term for this phase is the "go-live" operation.
- **Post-transition maintenance:** Once the system has been migrated to its production environment, it must be monitored for correct performance, the need for changes, and possible errors. System monitoring is a critical step in the long-term success of eGate. Routine checks and fine-tuning help to establish long-term performance benchmarks and aid in identifying undesirable changes.

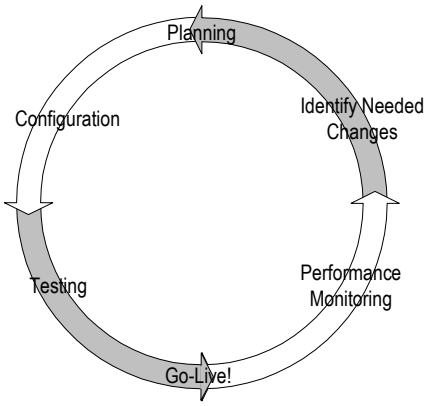
Figure 9 Testing, Transition, and Maintenance Phases



Change Management

An important part of the entire deployment project is change management. In the event that changes are required, they must be processed through the same cycle of planning, development and configuration, testing, transition to production, and maintenance monitoring as the rest of deployment. **Figure 10 on page 43** illustrates this cycle of change management.

Figure 10 Change Management Cycle



6.2 Pre-Transition Testing

An essential part of the implementation of any complicated system is thorough testing. You must do the following types of testing:

- **Unit testing,** testing of individual components and code in isolation
- **Integration testing,** testing of groups of components together, up to and including the entire system
- **Acceptance testing,** testing of a completed system (or portion thereof) to ensure that it meets the requirements established for it

For the most part, unit and integration testing are done in the development phase of the implementation, while acceptance testing is done as a final check before putting the system into production.

6.2.1 Testing Methodology

While how a system is tested varies, depending on the particulars of the specific system, certain methodologies apply to all system testing.

Parts to Whole

In general you must test the individual parts of the system before testing the entire system. Also along these lines, test individual components and blocks of code in isolation before testing them in a broader context.

6.2.2 Test Plan

Planning for system testing begins with a careful examination of the requirements of the system. A test plan is created in the analysis phase of the implementation. This test plan specifies how the system is tested and what requirements the system must meet before it is put into production (see **Chapter 3**). This test plan is further refined in the design phase of the implementation.

The functional and technical specifications outline the exact procedure used to conduct the tests, both at a component level and at a integrated system level. These specifications include:

- Type of data to use
- Expected output
- Who is responsible for the test

Type of Data To Use

The test plan specifies the type of data to use when testing the system. It is very important both at the component level and the integration level to work with data that is typical of the data that the system is designed to process. If possible, use real data from your pre-existing systems. Vary the data enough so that all possible types of processing implemented by the system are tested.

In addition to real-life typical data, use data designed to test the system's error handling. This data may have to be specially constructed.

Testing the Output

The test plan includes specifications for:

- Proper error handling
- Transaction processing speed
- Correct routing of information
- Correct transformation of data
- Any other special requirements

Responsibility for Testing

Who is responsible for a test depends on what type of test is done. In general, the responsibility for testing an individual component belongs to the developer who works on it. Whereas the responsibility for the testing of the entire system may fall to the project manager or the technical lead for the project. Acceptance testing is done by or in conjunction with people for whom the system is being created. Often this is the person or persons who are using the system when it is put in production.

6.2.3 Unit Testing

Unit testing checks the individual parts of a larger system for correct functioning prior to integration testing.

Each component and block of code used in the system must be unit-tested and its functionality verified before it can be used in the integrated system.

Unit testing is done as part of the development phase by the developer responsible for creating the component or code block in question. If the functional or technical specifications give a procedure for testing a particular component, this procedure must

be followed. If the specifications do not specify test procedures for a component, at a minimum the test must verify that the component or code block performs as outlined in the functional and technical specifications, testing individual parts of a system.

The tools used to test each part are different, depending on what the part is designed to do in the system. In addition, though all are designed to verify correct functioning, the methods employed vary, depending on the component being tested.

6.2.4 Integration Testing

Integration testing verifies how well the new components work together and with the existing eGate's infrastructure.

If the system is large and complex, you can break the integration testing into pieces designed to test a self-contained portion of the system.

Partial Integration Testing

Partial integration testing verifies correct data movement from one external system to another, that is, a complete data path. For example, you have a system that brings in data from a single external system then sends it to several other external systems. A partial test of this system would be to test whether the data can be sent to one of the external systems.

Complete System Testing

Complete system testing tests the entire system including the interaction with all the external systems. If the system is large and complex, this type of test requires a great deal of coordination. Set up this test to duplicate the actual production system. In fact, in many cases it is used as a dry run prior to doing the actual acceptance test.

Performance Testing

Closely related to integration testing is performance testing. Integration testing tests whether the system works, performance testing tests whether the system works fast enough. This type of testing must be done once a component or system is functioning correctly and transforming the data properly. It is important that you do this type of testing in the context of integration testing, because many factors in combination affect performance. Just speeding up one component may not speed up the performance of the entire system if the bottleneck lies elsewhere.

The exact requirement or goal in terms of the system's performance must be specified in the test plan. Whether you meet the goal determines whether you pass the test. An additional goal in performance testing is to find the bottlenecks in the system. Uncovering these bottlenecks allows additional system resources to be allocated intelligently in order to improve processing.

Speed Testing

This operation tests whether the system processes data fast enough. Make sure that the logging is set to the levels that will be used in production before doing a speed test;

higher-than-normal levels of logging can seriously degrade system performance and slow processing speed.

Stress Testing

This operation tests whether the system can handle the expected load. This type of testing attempts to overload the system with data to see whether or how it could fail. Effective stress tests include large volumes of messages, large sized messages, and multiple concurrent connections. Many times, network bottlenecks can be uncovered this way. The test plan describes the methodology to employ for this type of test.

6.2.5 Acceptance Testing

This test is done before moving the system into production and is used as a final check to prove to its end-users that it performs according to plan.

Acceptance testing can be for a partial system or for a complete system. If the entire system is not being put into production at the same time, acceptance testing can be done on the portion of the system going into production.

The test plan specifies all conditions the system has to meet to be acceptable to put into production (see **Table 5 on page 24**). In addition, the test plan specifies the person or persons who must approve the system and must be involved in the test.

6.3 Transition to Production

After fully verifying the performance and reliability of the system, the next step is to transition it to the live production environment, the transition-to-production phase, also call the go-live phase. This process can be affected by various factors, such as the proximity of the lab to the production location and the amount of equipment and information to move.

6.4 Post-Transition Maintenance

With your eGate up and running, it is important to monitor the system's performance, check for errors, and make any needed changes. **Figure 10 on page 43** shows the overall steps to take when changes are required. Such changes must be put through the same high scrutiny as the original system design — from analysis to testing to the eventual transition to production.

6.4.1 Implementing Changes

After a period of time, you may have to make changes to eGate. Changes are common as the needs of your end-users evolve and as additional external systems are added.

Do not make changes to the system hastily. Handle changes using the same process that was originally used to deploy your eGate. Consider the change management process illustrated in **Figure 10 on page 43**. Applying this same process of planning, configuration, testing, migration, monitoring, and re-evaluation ensures a sensible deployment.

See **Appendix A** for a sample QA report that addresses continuing system maintenance and change issues.

6.5 Transition to Production: Summary

The proper use of a lab environment provides an excellent opportunity to verify and refine the system configuration that was implemented earlier in the deployment process. Focusing on the deployment plan ensures the smoothest possible eGate deployment.

By thoroughly unit testing and system testing the system in the lab, costly errors are avoided and the end users are much more satisfied with the final results.

Going Forward

Once all the members of your management, your Deployment Project Team, and the end-users agree that the system is up and running according to plan, you have successfully finished the deployment of your eGate.

If you have any questions about further system operation and maintenance, see the appropriate documents listed in **"Supporting Documents" on page 8** or contact SeeBeyond.

Appendix A

eGate on HP NonStop Server

This chapter provides information for deploying and maintaining eGate on an HP NonStop Server system.

In this chapter

A.1 Introduction to eGate on HP NonStop Server

eGate Integrator provides a number of features, and takes advantage of many of HP NonStop Server's native facilities, to support scalability, reliability, and fault tolerance, when deployed on an HP NonStop Server system.

Scalability

Scalability, ensuring that the eGate Integrator system supports increased workloads and heavy demand periods, is achieved by providing multiple instances of a Collaboration running on different CPUs.

eGate uses message queuing, as configured by the user. All eGate components configured to consume from queues, do so in a round-robin sequence. This round-robin approach spreads the load across available CPUs.

The round-robin sequence is managed by HP NonStop JMS. As soon as a Collaboration on a Logical Host CPU is available, it requests to consume from the HP NonStop JMS queue.

Reliability

If a Logical Host's CPU fails, the generic process **LHInit** will terminate, along with the rest of the Logical Host components on the failed CPU. When the CPU is restored the HP NonStop Server starts the installed SeeBeyond LHInit process. LHInit then starts the rest of the eGate components in the Logical Host running in that CPU.

Fault Tolerance

When a Collaboration is configured to use XA transactions, any transaction in process by a Collaboration on a CPU that fails, that is not committed at the time of the failure, is rolled back and retained in the queue.

In the event of a CPU failure, the next available Collaboration running on an available configured eGate Logical Host CPU handles the queued transaction until the CPU that went down is restored or a new CPU is installed.

A.1.1. Installation and Configuration of eGate Integrator on HP NonStop Server

For directions on the installation of eGate Integrator on an HP NonStop Server system, including system requirements and Logical Host and Repository installation, see the *eGate Integrator Installation Guide*.

A.1.2. LHInit

The LHInit program starts the Logical Host and restarts eGate in the event of a CPU failure. When the Logical Host is first loaded onto HP NonStop Server, LHInit must be manually installed and started as a generic process. It is made persistent by HP NonStop Server system software.

If a CPU failure occurs under normal operation, the LHInit generic process is terminated along with the rest of the Logical Host components on the failed CPU. Upon restart of the failed CPU, the HP NonStop Server starts the LHInit process, which starts eGate. Once all of the eGate components have started, the Logical Host is ready to handle actions related to the operation of the eGate components.

LHInit must be installed on each CPU that is running a Logical Host. Each Logical Host, running on the same computer under the same TCP/IP process, must be configured to use different ports which are not already in use. Use the PortUtil utility to determine which ports are in use.

For directions on installing and configuring the Logical Host, the LHInit process, and the PortUtil utility, see the *eGate Integrator Installation Guide*.

A.1.3. Repository and Pathway

The Repository stores the Project (logical components and configuration) and Environment (physical resources and configuration) information required for an implementation. The Repository installation includes the **SeeBeyond Repository Server** and the **Repository Library**. The Repository Server manages the SeeBeyond Repository, the Enterprise Manager, as well as SNMP processes.

A Windows computer with FTP capabilities is required to install the Repository on HP NonStop Server. For directions on installing the Repository on HP NonStop Server see the *eGate Integrator Installation Guide*.

Repository under Pathway for HP NonStop Server

The **pathmon** facility (native to HP NonStop Server) monitors processes to protect them against CPU failure. The SeeBeyond-supplied script **pathway.sh** invokes some of the pathmon capabilities to provide high availability failover for eGate Repository processes.

Pathway allows the user to:

- Check the status of a Repository pathway process
- Stop execution of a running Repository pathway process
- Resume execution of a frozen Repository pathway process
- Permanently delete a Repository pathway process

The pathway process will automatically restart in case a JVM failure or bad user code causes the Repository Server to terminate abnormally or in the case of a CPU failure. In the case of a restart, users will be able to reconnect to the Repository after restarting the Enterprise Designer—the Enterprise Designer must be restarted to obtain a new socket.

For information on running Repository Pathway process and Pathway commands, see the *eGate Integrator Installation Guide*.

A.1.4. Transaction Monitoring Facility

The HP NonStop Server provides Transaction Monitoring Facility services with the HP NonStop Transaction Manager/Massively Parallel (NonStop TM/MP) service. NonStop TM/MP service protects a database from damage caused by transaction failure, operator error, and file or volume loss. It does so by recording recovery data in an audit trail file. This data allows the NonStop TM/MP service to rebuild the database after a failure occurs.

The SeeBeyond Message Server utilizes NonStop TM/MP to provide XA services. Collaborations configured to use XA will take advantage of the NonStop TM/MP services. Alternatively, users can use JTA User Transactions within their Collaborations to utilize the NonStop TM/MP services.

The advantage to using XA is that the messages are protected by NonStop TM/MP as they enter and leave the Collaboration. Collaborations using JTA User Transactions will only utilize NonStop TM/MP while the messages are being processed within the Collaboration.

A.1.5. Configuring for Maximum Scalability

One way to utilize multiple CPUs is to create multiple instances of each Collaboration. Each instance of the Collaboration will run in its own Integration Server within its own Logical Host (as shown in Figure 11). Each Logical Host will run on a separate CPU. You can create Collaboration instances for as many CPUs as your system has available.

Figure 11 Multiple Logical Hosts

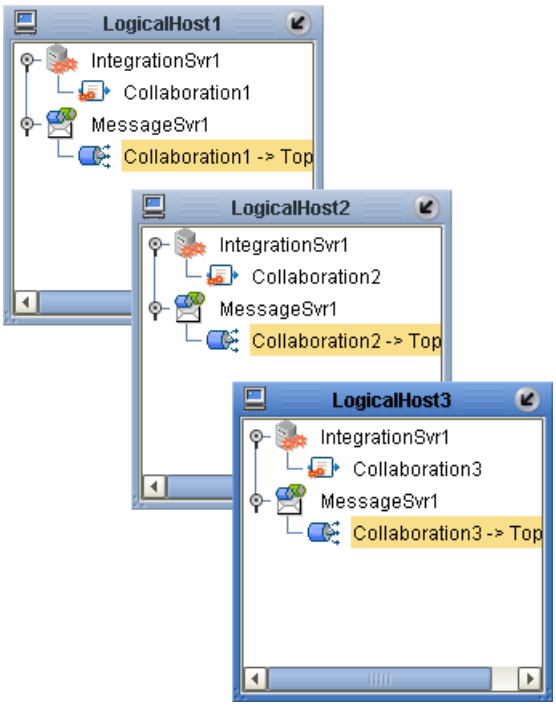
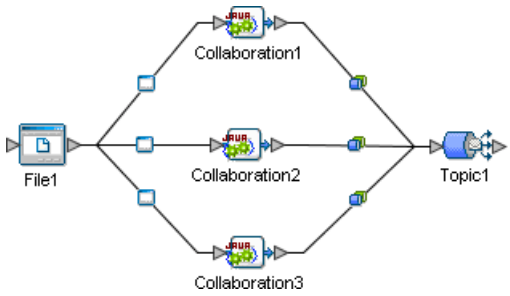


Figure 12 shows three Collaboration instances. Depending on the business logic the Collaboration is performing, it may or may not be best to use the same Collaboration Definition for each Collaboration. If each Collaboration instance is performing the same function, you will use the same Collaboration Definition; if the Collaborations are performing different functions, they should have their own unique Collaboration Definitions.

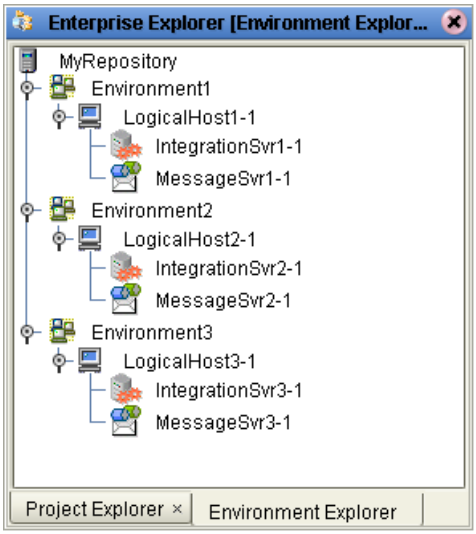
Figure 12 Multiple Collaboration Instances



An example of a situation where you would use unique Collaboration Definitions for each Collaboration would be if you were accessing unique data sources. For example, in a case where a table spans multiple partitions of a database, each partition is identified by key values. To select records from a specific key range, you would use unique Collaboration Definitions for each Collaboration. In this case, you would add the business logic to each of the Collaboration Definitions to select unique key ranges from the table.

An alternative way to utilize multiple CPUs is to create only one Collaboration instance and deploy it to multiple Environments. This method would be appropriate when each of the deployed Collaborations is intended to execute the same business logic. In this case, you would add a unique Environment, Logical Host, Integration Server, and Message Server for each CPU you intend to use. Then you would create a unique Deployment Profile for each Environment and deploy the Collaboration to each of the Integration Servers.

Figure 13 Multiple Environments



A.1.6. Configuring Logical Hosts to use Parallel TCP/IP

Multiple Logical Hosts can be configured to share TCP/IP listening ports through the use of the HP NonStop Server's *Parallel TCP/IP* (PTCPIP) functionality. Parallel TCP/IP provides improved scalability, improved availability, and simplified configuration:

- **Improved scalability**: The Parallel TCP/IP service provides load balancing by automatically distributing the client connection requests across listener processes across multiple CPUs.
- **Improved availability**: In the event of a CPU failure, the PTCPIP service redirects the client requests to the next available CPU resource.
- **Simplified configuration**: When using Parallel TCP/IP, there is no need to configure a cascading list of listener addresses. The PTCPIP service automatically redirects the client requests using the same IP address and port (if port sharing is configured for the eGate Logical Host).

Configuring PTCPIP without Port Sharing

Logical Hosts can be configured to utilize the Parallel TCP/IP service and *not* share ports. To configure a Logical Host to use PTCPIP without port sharing, remove the comment character (#) from the following line (shown in bold) in the **lh.profile** file in the Logical Hosts's **/bootstrap/bin** directory:

```
# 2.1.2 PARALLEL TCP/IP: Set =TCPIP^PROCESS^NAME to TCPSAM process
name
# add_define =TCPIP^PROCESS^NAME class=map file=\$TSAM2
```

Note: *If you plan to enable Parallel TCP/IP service, you must insert a comment character (#) before the line in section 2.1.1 to disable Conventional TCP/IP.*

Configuring PTCPIP with Port Sharing

Logical Hosts are configured to use PTCPIP with port sharing by modifying the contents of the **lh.profile** file in the Logical Host's **/bootstrap/bin** directory. To configure a Logical Host to use PTCPIP with port sharing, remove the comment character (#) from the following two sections (shown in bold):

```
# 2.1.3 PARALLEL TCP/IP WITH PORT SHARING: !! Use extreme caution !!
#  . Set =TCPIP^PROCESS^NAME to TCPSAM process name
#  . Set =PTCPIP^FILTER^KEY to a secret key that is to match another
#    logicalHost or components that need to share TCP/IP port
#    number(s).
#    The secret key should be of legal Guardian file name format.
# add_define =TCPIP^PROCESS^NAME class=map file=\$ZTC0
# add_define =PTCPIP^FILTER^KEY  class=map  file=\$EGATE.TCPIP.EWAY
```

Note: *If you plan to enable Parallel TCP/IP service, you must insert a comment character (#) before the line in section 2.1.1 to disable Conventional TCP/IP.*

Using this option in more than one Logical Host allows all these Logical Hosts to share TCP/IP listening ports. This especially benefits the TCP/IP eWay, because remote TCP/IP client connection request will be distributed by the PTCPIP service to the TCP/IP eWay running on different Logical Hosts. (For more information, see the *TCP/IP eWay Intelligent Adapter User's Guide*.)

It is important to note that any Logical Host can be configured with a shared TCP/IP port—whether it is intended to be shared or not. You must take care not to configure two Logical Hosts with the same port number when the Logical Hosts are not intended to share ports via Parallel TCP/IP.

Glossary

Collaboration
Contains the information about executing a set of business rules. Such information includes the name of the Collaboration Definition, and the binding information for connecting to JMS topics, queues, and eWays.

Collaboration Definition
The encoding of business rules, in Java or XSLT format. Typically, the encoding consists of operations on OTDs (see **"OTD" on page 55**). Several Collaborations can have the same Collaboration Definition.

Connection
Consists of the configuration information that enables an eWay to connect to an external system.

Connectivity Map
Contains business logic and routing information about the data transmission. A Connectivity Map usually includes one or more Collaborations, Passthrough Collaborations, topics, queues, and eWays. A Connectivity Map is created under a Project. A Project may have multiple Connectivity Maps.

Constants
A name or value pair that is visible across a Project.

Deployment Profile
Contains the information about how the Project components will be deployed in an Environment. A Project can have multiple Deployment Profiles, but only one Deployment Profile can be activated for a Project in any one Environment.

Derived Collaboration
Collaboration that inherits operations from another, according to standard object-oriented practice.

eGate System
See **"Project"**.

Environment
A collection of physical resources and their configurations that are used to host Project components. An Environment contains logical hosts and external systems.

eWay
A link between a Collaboration and an external connection including the message server connection (topic or queue) or external application.

External Application
A logical representation of an external application.

External System
A representation of an external application system.

ICAN Suite
The SeeBeyond Integrated Composite Application Network Suite, which is based on eGate Integrator.

Integration Server
Software platform that houses the business logic container used to run Collaborations. Provides transaction services, persistence, and external connectivity.

Link
The JMS Connection between a Collaboration and a topic or queue in a JMS-compliant message server.

Linked Message Destination
A reference to a Message Destination defined in another Connectivity Map.

Logical Host
An instance of the eGate runtime Environment that is installed on a machine. A Logical Host contains the software and other installed components that are required at runtime, such as application and message servers.

Management Agent
Uses J2EE technology to manage and monitor an eGate 5.0 deployment that may contain other application servers in addition to the SeeBeyond Integration Server. Defines management interfaces and services designed for distributed environments, focusing on providing functionality for managing networks, systems, and applications.

Message Destination
A general term for a topic or queue. Two or more Projects can share a message destination that has the same name and is deployed on the same message server. A single Project may also have a single message destination referenced in multiple Connectivity Maps.

Message Server
JMS-compliant, guaranteed delivery store, forwarding, and queueing service.

OTD
An acronym for Object Type Definition. OTDs contain the data structure and rules that define an object. An OTD is used in Java Collaboration Definitions for creating data transformations and interfacing with external systems.

Project

Contains a collection of logical components, configurations, and files that are used to solve business problems. A Project organizes the files and packages and maintains the settings that comprise an eGate system in SeeBeyond's Enterprise Designer.

Queue

A JMS queue is a shareable object that conforms to the *point-to-point* (p2p, or PTP) messaging domain, where one sender delivers a message to exactly one receiver. When the SeeBeyond Message Server sends a message to a queue, it ensures it is received once and only once, even though there may be many receivers "listening" to the queue. This is equivalent to the subscriber pooling in other queue implementations. You can reference a queue that exists in another Connectivity Map or Project.

Repository

Stores and manages the setup, component, and configuration information for eGate Projects. The Repository also provides monitoring services for Projects, which include version control and impact analysis.

Schema Runtime Environment

An add-on in eGate 5.0 that provides the upgrade path for e*Gate 4.x users to upgrade to eGate 5.0. Also known as the SRE.

Security Server

A standalone server that is the connection point to underlying eGate security environments.

Subproject

An independent Project that is included as part of another Project and listed on the Enterprise Explorer tree beneath the main Project icon.

Topic

A JMS topic is a shareable object that conforms to the *publish-and-subscribe* (pub/sub) messaging domain, where one publisher broadcasts messages to potentially many subscribers. When the SeeBeyond Message Server publishes a message on a topic, it ensures that all subscribers receive the message.

XSLT

An acronym for Extensible Stylesheet Language Transformations. A file format used in eGate to generate Collaboration Definitions.

e*Gate 4.x Terms in eGate 5.0

Table 8 provides definitions for the terms that are new with eGate release 5.0, as well as equivalent terms from eGate release 4.x.

Table 8 eGate 5.0 Terms

5.0 Term	4.x Equivalent Term
Collaboration	Collaboration
Collaboration Definition	Collaboration Definition
Connection	e*Way Connection
Connectivity Map	Closest: Network View of an entire schema
Deploy	Run the Control Broker
Deployment	<none>
Deployment Profile	Closest: schema
Enterprise Designer	Enterprise Manager
Enterprise Manager	Enterprise Monitor
Environment	Schema (except only includes physical information, not business logic)
eWay	e*Way Connection e*Way
eWay Configuration	e*Way Connection Configuration
External Application	e*Way Connection
External System	e*Way Connection
JMS Connection	e*Way Connection
Integration Server	<none>
Link	JMS e*Way Connection
Linked Message Destination	<none>
Logical Host	Participating Host
Message Destination	Topic or queue
Message Server	JMS IQ Manager
Object Type Definition (OTD)	Event Type Definition (ETD)
Process Manager	Control Broker
Project	Schema (except not including physical layer)
Queue	JMS queue
Repository	Registry
Subproject	Schema

Table 8 eGate 5.0 Terms (Continued)

5.0 Term	4.x Equivalent Term
Topic	JMS topic
XSLT	<none>

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