

HOW TO PROPERLY ADMINISTER AND OPERATE A BIZTALK SERVER INFRASTRUCTURE

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1. ABOUT CODIT

Large, international companies often struggle to easily exchange data with their subsidiaries, customers, suppliers and other business partners. Many also face challenges with the upcoming trends such as Cloud, SaaS apps, Mobile, Internet of Things, Big Data... Companies not only have to be aware of them, yet have to adopt these technology changes strategically to gain competitive advantage. That is exactly what our expert teams do: we integrate business applications with the newest Microsoft technologies.

1.1. AUTHOR

Jeroen Hendriks

1.2. REVIEWERS

I would like to thank the entire team for reviewing this white paper.

2. INTRODUCTION

Most often BizTalk Server is one of the most important building blocks of an IT infrastructure, responsible for processing critical data, which means that downtime and data loss can have a significant impact on the business. Such a critical part of an IT infrastructure must therefore be operated with care by administrators who possess the required knowledge and experience. Yet most system administrators are not familiar with BizTalk Server. This can prove challenging for the team that is responsible for organizing the support of a BizTalk Server infrastructure in their organization and as a result of this, can pose risks to the organization as a whole.

This white paper is intended to help ICT project managers, ICT managers / team leads and senior system administrators among others to understand the needs and requirements that are necessary to administer and operate a BizTalk infrastructure. It is not only intended for organizations that are new to BizTalk Server, but also for organizations that have been using BizTalk Server for some time and want to gain a better insight. The above mentioned goal leads to the central question that will be answered in this white paper:

What is needed in order to properly administer and operate a BizTalk Server infrastructure?

The central question is divided in the following sub-questions:

- What is BizTalk Server administration?
- What tasks should a BizTalk Server administrator perform?
- What knowledge and experience should exist in the BizTalk Server administration team?

To help answer these questions, valuable input was contributed by several BizTalk community members as well as by my colleagues.

3. BIZTALK SERVER ADMINISTRATION

Managing a BizTalk Server infrastructure is a complex and knowledge-intensive operation.

Part of this complexity comes from the fact that a BizTalk Server infrastructure typically is built on different products such as Windows Server, BizTalk Server, SQL Server, etc. This means that a BizTalk Server administration team needs to have extensive knowledge of the following technologies:

- Windows Server
- Microsoft SQL Server
- MSDTC (Microsoft Distributed Transaction Coordinator)
- Microsoft BizTalk Server
- Internet Information Services (IIS)
- Network Load Balancing (NLB)
- Windows Failover Clustering

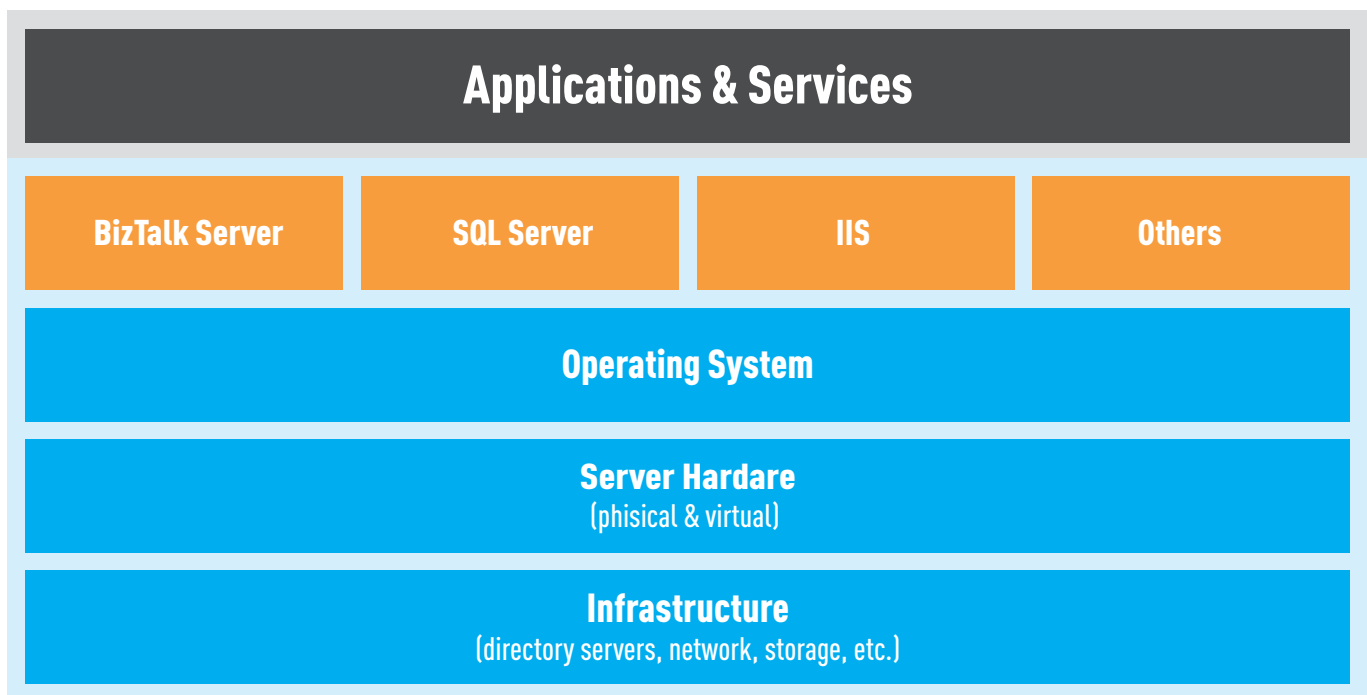
Furthermore there are technologies for which it is sufficient that a BizTalk Server administration team has basic knowledge. This does not mean that these technologies are not important for a BizTalk Server infrastructure, but normally other teams are responsible for maintaining these.

The team needs to have basic knowledge of the following technologies:

- Server hardware
- Virtualization
- Storage
- Networking
- Active Directory
- Monitoring tooling (e.g. SCOM)

This will be described in paragraph 4.5.

The figure below gives an overview of the different technical layers which make up the BizTalk Server infrastructure:



Another aspect which adds to the complexity is the fact that a BizTalk Server infrastructure integrates applications in a heterogeneous application landscape. This landscape is not restricted to within the organization. A BizTalk Server infrastructure can also be used for integration scenarios with external partners and customers, or in the 'cloud'. This means that a BizTalk administrator needs to have at least basic knowledge of communication protocols and message formats. Furthermore administrators need to have knowledge of how the chain of servers, applications and services work together to service a business process. Not only technical knowledge but functional knowledge is required as well.

The BizTalk Server infrastructure consists of two types of communication patterns, synchronous and asynchronous. These two types of communication patterns need to be treated differently, because in a synchronous communication pattern an end-user or system is waiting for a reply, whereas in an asynchronous communication pattern messages are queued.



Figure 2 - synchronous versus asynchronous communication

The activities that need to be performed when managing a BizTalk Server infrastructure are described in the following paragraphs. These activities are based on the ITIL methodology.

3.1. OPERATIONS MANAGEMENT

The IT operations management team provides day-to-day technical supervision of the ICT infrastructure, in this case the BizTalk Server infrastructure. The role of operations management is often confused with that of incident management. Operations management however is not solely concerned with incidents reported by users, but also with events generated by the infrastructure.

The operations management team should primarily work from documented processes and procedures and should be concerned with a number of specific sub-processes.

They are responsible for:

- A stable, available and secure ICT infrastructure
- Maintenance plan
- Operational procedures (such as start-of-day procedures)
- Monitoring
- Backup and recovery
- Documentation

The paragraphs below describe these tasks.

3.1.1. MONITORING

Good monitoring practices are important for a BizTalk Server infrastructure to keep the system healthy. An incident on the BizTalk Server infrastructure may not only affect a group of users, but the entire organization and possibly their customers and partners. Good monitoring practices enable a BizTalk Server administration team to attain maximum availability of the BizTalk Server infrastructure. A monitoring system should focus on all layers of the BizTalk Server infrastructure.

The figure below provides a graphical representation:

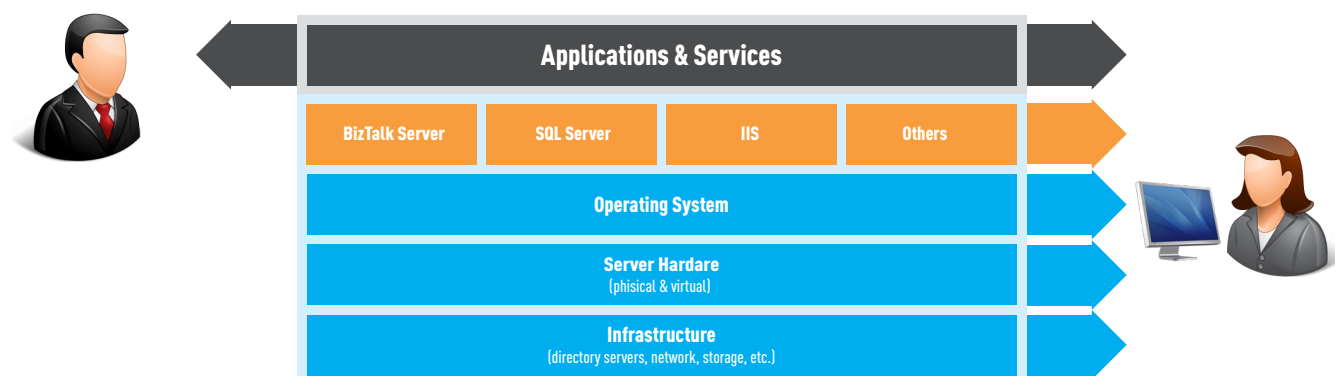


Figure 3 - Monitoring

Ideally events should be noticed and resolved by an administrator before users experience an incident on their system.

The BizTalk Server infrastructure may generate events that can lead to future incidents. By being proactive the BizTalk Server administration team can prevent incidents from happening, instead of reacting to them. This will improve the availability of the BizTalk Server infrastructure. A simple example is a warning that a database disk is running out of disk space. An administrator can take preventive measures to increase free disk space before the database stops functioning.

A BizTalk Server infrastructure can range from a single server platform to a multi-server and multi-application platform. Events can occur on several servers and several locations (for example the event viewer, application logs, performance counters, etc.). It is not very efficient nor effective when an administrator checks every server in the BizTalk Server infrastructure for events manually. Ideally the BizTalk Server administration team uses a monitoring tool such as Microsoft’s System Center Operations Manager (or a third-party tool such as BizTalk360®). In this way all events can be collected and displayed in a central console. Additionally, monitoring tools can be configured to warn an administrator when a specific event happens or a threshold is reached. For instance, when a disk falls below 15% free disk space. Furthermore the monitoring tool can be configured to automate specific tasks (e.g. restart a service that is leaking memory when the amount of memory used by that service exceeds 200 MB). This can prevent incidents, or correct them, without the need for human action.

The BizTalk Server administration team must make sure that good monitoring is in place. They should configure the monitoring tools to generate error warnings for events that they should act upon to keep the system healthy. During operating hours the team should pro-actively monitor the BizTalk Server infrastructure.

3.1.2. MAINTENANCE PLAN

Incidents must be avoided as much as possible. To do so, the BizTalk Server administration team should develop a maintenance plan. The maintenance plan should consist of periodically planned system-checks using a set of (specialized) tools.

The team can base these checks on the Microsoft operations guide¹ for BizTalk Server, specifically the Performance and Maintenance section¹.

The graph below provides a graphical representation on why to prevent as many incidents as possible. It shows that if the number of incidents and events decrease, the availability increases.

¹ <http://msdn.microsoft.com/en-us/library/gg634499.aspx>

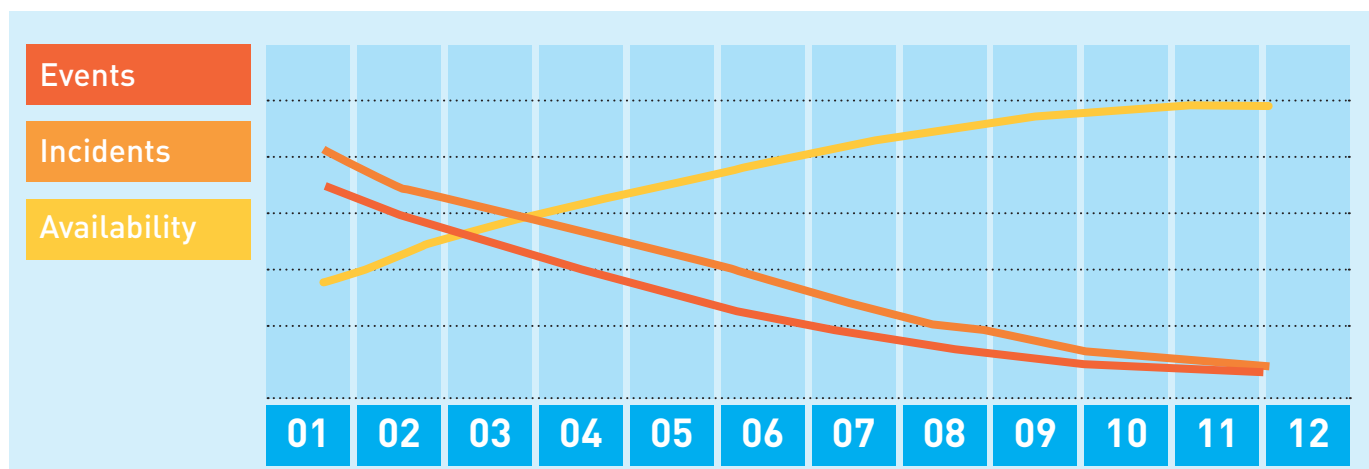


Figure 4 - Benefits of a maintenance plan

3.1.3. BACKUP AND RECOVERY

There are many ways to protect against failures. These depend on technical aspects, Service Level Agreements and existing business continuity processes. The BizTalk administration team should create a backup and/or a disaster recovery plan according to these aspects. The backup and recovery plan should cover all elements of every layer in the BizTalk Server infrastructure (see Figure 1 - Technical layers). For example the backup of the BizTalk layer consists of various elements such as BizTalk Server configuration, BizTalk applications, BizTalk application configuration, BizTalk databases, etc.

To ensure the validity of this plan it should be tested periodically. Testing the plan trains the administrators in carrying out the procedure, so that they can perform the plan more efficiently and effectively when they are required to do so.

3.1.4. DOCUMENTATION

Documentation is an important part of operations management. Standardizing and documenting procedures will reduce the time needed to carry out different procedures (e.g. installing new software or solving a specific problem) as well as reduce the possibility of mistakes occurring.

The BizTalk administration team should document the following:

- Known issues
- Configuration
- Installation procedures
- Common operational procedures
- Procedures checklist
- Environment setup
- Naming conventions
- Acceptance criteria for new applications

The documentation will partly come from a development team. For example, BizTalk applications sometimes have specific installation requirements. The BizTalk administration team should set up guidelines stating the requirements they have on specific types of documentation (e.g. installation manual, list of sources, etc.).

Incidents can never be prevented 100%. The BizTalk administration team must therefore offer second and third line support. This support should focus on resolving incidents according to the SLA requirements.

When an incident has been resolved, the BizTalk administration team should document the solution or workaround in a knowledge base. This way knowledge on resolving incidents will be preserved and can be used for future reference. This measure is designed to help reduce the time needed to resolve incidents and thus increase availability.

3.2. INCIDENT MANAGEMENT

Solving incidents on the BizTalk Server infrastructure can be challenging due to the complexity of the environment. A BizTalk Server infrastructure typically consists of multiple servers and multiple applications. Not only does an administrator require a thorough understanding of the products and software used, he also needs to know how the applications interact together.

The BizTalk administration team should focus on preventing incidents on the BizTalk Server infrastructure. One of the ways they can do this is by working together with the BizTalk development team and setting up guidelines on error handling. During the development and testing phases error handling can be built into an application. For instance, retry mechanisms can be built in, functional errors can automatically be routed to functional administrators, etc. A second method to prevent incidents is to do a root cause analysis when an incident occurs. By taking away the root cause of an incident the problem will be prevented from reoccurring.

3.3. PROBLEM MANAGEMENT

Problem management of the BizTalk Server infrastructure provides the same difficulties as incident management. In case of performance problems for example, the source of these problems could prove difficult to pinpoint. Maybe there is not enough network bandwidth, BizTalk SQL Server jobs may not be running, databases may have a bottleneck in disk I/O or an IIS server may be low on memory. There could even be multiple root causes.

When the BizTalk Server administration team documents every incident on the BizTalk Server infrastructure, they should perform a root cause analysis. This can even be part of the health check plan. The BizTalk Server administration team should periodically evaluate incidents to see if there is a common root cause. This root cause can then be recognized and handled as a problem that needs to be solved.

3.4. APPLICATION MANAGEMENT

The application management process ensures that standard methods and procedures are used in which both deployment and updates for BizTalk applications are efficiently and effectively implemented. Good application management practices are vital for the BizTalk Server infrastructure.

This necessity is partly because of the number of artifacts that are used in the BizTalk Server applications:

- Orchestrations
- Schemas
- Maps
- Ports
- NET components
- SSO configuration
- Web services
- WCF services
- WF Workflows
- Business Rule Policies
- Business Activity Monitoring

The number of artifacts adds to the complexity because the BizTalk Server infrastructure is a multi-server and multi-application environment. Artifacts have to be deployed to the correct environment and the correct server.

The BizTalk Server administration team needs to be able to streamline the application management process and implement changes in the production environment at minimal risk. For every release they should create an implementation plan. This plan should not only consist of a procedure on how to do the implementation, but should contain a fallback plan as well. Of course the changes should be documented for future reference.

Changes in BizTalk Server applications are often part of a larger change to the whole infrastructure. E.g. if a message schema in BizTalk changes, the system that delivers that type of message to BizTalk may have changed as well. The BizTalk Server administration

team should therefore coordinate a change with the people responsible for implementing the change on the systems (internal and/or external) surrounding BizTalk Server. Also, most often the development team of a new release knows best what components were changed. Therefore their input in the application management process is important.

3.4.1. BIZTALK SERVER ARTIFACTS VERSIONING

The BizTalk Server artifacts come in minor and major version upgrades. How they are classified depends on the significance of the change. This can vary from case to case.

Versioning artifacts is mainly a task for the development team. However, good versioning practice is key for a stable production environment. A wrong version running in production can result in unpredictable results. To prevent this, the BizTalk Server administration team must document which versions need to run in production and periodically check this. These version numbers should be supplied by the development team.

3.5. PLATFORM MANAGEMENT

The BizTalk Server administration team needs to have a system for platform management. This system can be divided into three categories:

- Update policies
- Performance monitoring
- BizTalk Server configuration

These three categories are discussed next.

3.5.1. UPDATE POLICIES

Microsoft regularly releases hot fixes, security patches, cumulative updates and service packs. The BizTalk Server administration team must create a patch management policy for the BizTalk Server infrastructure. This policy can also be based on a broader policy for the entire IT infrastructure. The policy for example can state that all patches should be

installed within a month and that they should be tested on test systems before installing them on the production environment. The team should install the hot fixes, security patches, cumulative updates and service packs according to the patch management policy.

3.5.2. PERFORMANCE MONITORING

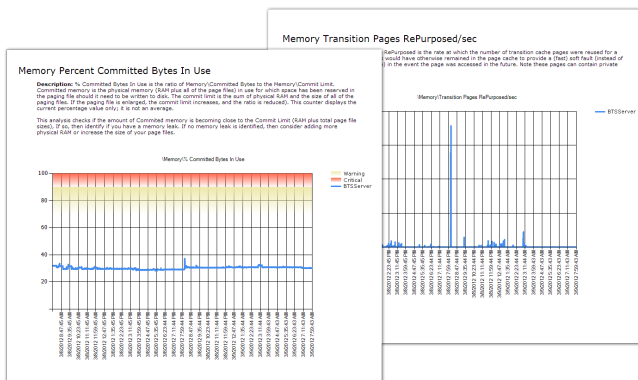
The BizTalk Server infrastructure needs to be able to handle all service requests required by the business. The infrastructure should initially be sized to do this, but over time requirements may change. An organization may grow and as such require a higher capacity.

To prevent the business from experiencing performance problems the BizTalk Server administration team should monitor the load and resources used on the BizTalk Server infrastructure. Based on a trend analyses future capacity requirements can be estimated. Based on this estimation the BizTalk Server administration team can take preventative actions.

3.5.3. BIZTALK SERVER PLATFORM CONFIGURATION AND INFRASTRUCTURE INVENTORY

The BizTalk Server administration team should register software, application and hardware configuration and settings. E.g. the software versions of BizTalk Server and SQL Server, as well as the installed hot fixes, cumulative updates and security patches.

Furthermore the application settings should be recorded. Thanks to this the BizTalk Server administration team will be able to detect unauthorized changes. In a worst case scenario, when it is necessary to reinstall an application, the BizTalk Server administration team knows exactly which settings should be used.



Besides organic growth a higher capacity may be needed because new interfaces are being deployed to the BizTalk Server infrastructure.

The BizTalk Server administration team should work together with the project team that developed the new interface to determine what the extra load will be, and perform a load and/or performance test to see what the impact of the new interface on the BizTalk infrastructure is. Based on the test results the performance can be tuned.

4. ROLES

The BizTalk Server infrastructure consists of multiple applications and custom developed software. Because of this, managing the BizTalk Server infrastructure is very knowledge-intensive. To manage it effectively a team of administrators, each with specialized knowledge, is needed. The different roles needed and the activities that are part of their job role are described in the following paragraphs. These paragraphs also contain the level of knowledge needed to perform these roles. Wherever possible an industry standard level of certification is given.

Depending on the size of the organization a person can perform multiple roles, or one role can consist out of multiple persons. Because the BizTalk Server infrastructure is a tightly knit environment the different roles should work together. For instance, installing a security patch on the operating system can cause problems on the BizTalk Server layer. If the Windows Server administrator did not communicate the installation with the BizTalk Server administrator, the BizTalk Server administrator will have a more difficult time troubleshooting and solving that problem.

To prevent problems like this from occurring, the different roles must work together closely.

It is important to note that only the job roles for the administrators who are going to manage the BizTalk Server infrastructure are described. For architecting the infrastructure and planning the installation more senior administrators (often called system engineers or infrastructure engineers) are needed.

4.1. WINDOWS SERVER ADMINISTRATOR

The BizTalk Server infrastructure runs on Windows Server. The Windows Server administrator is responsible for managing the operating system as well as managing applications such the firewall, IIS, etc.

4.1.1. ACTIVITIES

The Windows Server administrator performs the following activities:

- Monitor Operating System health status
- Resolve tier-2 and tier-3 incidents
- Solve system problems
- Install hotfixes, security patches and service packs for Windows Server Monitor IIS Install changes on IIS
- Create and maintain documentation (e.g. installation manual for software releases / installation procedure security patches / backup and recovery procedures)
- Monitor and optimize system performance / resources
- Manage anti-virus software (if required according to company policies)
- Manage Windows firewall (if required according to company policies)
- Automate administrative tasks
- Test and perform backup and recovery procedures
- Manage system settings
- Periodically test clusters or NLB
- Monitor end-of-life of software
- Virtualization tasks (Hyper-V)

4.1.2. LEVEL OF KNOWLEDGE

Windows Server is an integral part of the BizTalk Server infrastructure and vital for the stability. Because typically complex technologies like Windows Failover clustering are used an experienced administrator is required. The Windows Server administrator should at least have a bachelor level with two or more years of relevant experience as an IT professional with Windows networks. Preferably the Windows Server administrator has the following certification (or equal): Microsoft Certified IT Professional: Server Administrator ²

² <http://www.microsoft.com/learning/en/us/certification/mcitr.aspx>

4.2. BIZTALK SERVER ADMINISTRATOR

BizTalk Server is at the heart of the BizTalk Server infrastructure. Messages are sent to, received from, and processed by BizTalk Server. The BizTalk Server administrator plays an important role in the team that manages the BizTalk Server infrastructure. He will be responsible for managing BizTalk Server nodes and Enterprise Single Sign-on. In BizTalk Server there are two administrative roles defined by Microsoft:

- **BizTalk Server administrator:** This is a high privilege role with full access to the BizTalk environment.
- **BizTalk Server operator:** This is a low privilege role with limited access.

Depending on the size of your BizTalk Server administration team you can separate this role into the two categories. E.g. the experienced BizTalk Server administrator can take on the administrator role, while the less experienced team member takes the operator role.

4.2.1. ACTIVITIES

- Monitor BizTalk Server health status
- Manage message flow (e.g. resume suspended messages and handle terminated service instances)
- Resolve tier-2 and tier-3 incidents
- Solve BizTalk Server problems
- Install security fixes, hot patches, cumulative updates and service packs for BizTalk Server
- Perform deployments
- Run BizTalk MsgBoxViewer and analyze results
- Run BizTalk Best Practice Analyzer and analyze results
- Manage tracking data
- Create and maintain documentation (e.g. installation manual for BizTalk releases / backup and recovery procedures)
- Monitor and optimize performance
- Automate administrative tasks
- Create maintenance plans
- Test and perform backup and recovery procedures
- Manage BizTalk Server settings
- Maintain high-availability solutions
- Install and configure adapters, hosts, host instances
- Monitor end-of-life of software

4.2.2. KNOWLEDGE LEVEL

BizTalk Server relies heavily on SQL Server. Many settings to optimize BizTalk Server have to be done in SQL Server. Furthermore procedures like backup and recovery include both BizTalk Server servers and the BizTalk SQL Server databases. This means that the BizTalk Server administrator should have at least a basic understanding of SQL Server. Preferably the roles of BizTalk Server administrator and database administrator (specifically for the BizTalk database server) should be combined.

The BizTalk administrator should have at least a bachelor level degree with three or more years of relevant experience as an IT professional in Windows networks. He should have at least two years of experience managing BizTalk Server and have a basic understanding of SQL Server technologies.

There are only industry standard certifications for BizTalk Server development. This means that there are no certifications for BizTalk Server administrators. Although not required, it is a plus for a BizTalk Server administrator if he passes the following (developers) exam:

Technology specialist: Developing Business Process and Integration Solutions by Using Microsoft BizTalk Server 2010³.

³ <https://www.microsoft.com/learning/en/us/exam.aspx?id=70-595&locale=en-us>

4.3. DATABASE ADMINISTRATOR

The database administrator is responsible for managing the databases (based on the Microsoft SQL Server platform) needed for the BizTalk Server infrastructure. These databases are primarily used by BizTalk Server to store messages, tracking information and configuration settings.

4.3.1. ACTIVITIES

The Database administrator performs the following activities:

- Monitor database server instance and database health status
- Resolve tier-2 and tier-3 incidents
- Install security fixes and hot patches for SQL Server
- Solve SQL Server problems
- Maintain high-availability solutions
- Automate administrative tasks (for example, checking database stats, backups)
- Maintain administrative tasks (for example, determining index rebuild time, file groups for backup)
- Performance optimization (for example physical tuning, including hardware, operating system, instance-level tuning)
- Perform deployments and migration
- Test and perform backup and recovery procedures
- Periodically test clusters
- Create and maintain documentation (e.g. installation manual for releases / installation procedure security patches / backup and recovery procedures)
- Manage SQL Server settings
- Monitor end-of-life of software

4.3.2. LEVEL OF KNOWLEDGE

The database administrator should have at least a bachelor level degree with two or more years of relevant experience as an IT professional managing Microsoft SQL Server. Preferably the Windows Server administrator has the following certification: MCITP: Database Administrator 2008 ⁴.

⁴ <http://www.microsoft.com/learning/en/us/certification/cert-sql-server.aspx#tab3>

As stated in paragraph 4.2.2 BizTalk relies heavily on SQL Server. BizTalk Server requires some non-standard settings of SQL Server, for example on how to back up the databases. The SQL Server administrator should be familiar with these specifics.

4.4. MONITORING TOOL ADMINISTRATOR

A good monitoring tool is key to solving or preventing events and incidents. The administrator of the monitoring tool is responsible for providing a central console from which the other members of the team can monitor the BizTalk Server infrastructure. He is also responsible for configuring the events that should be monitored and setting thresholds for warning and alerting.

4.4.1. ACTIVITIES

- Configure events to monitor
- Configure warning and alerting levels
- Create scripts to resolve events automatically
- Monitor monitoring tool health status
- Solve events
- Install security fixes and hot patches for monitoring tool
- Create and maintain documentation
- Automate administrative tasks
- Test and perform backup and recovery procedures
- Monitor end-of-life of software

4.4.2. LEVEL OF KNOWLEDGE

The monitoring tool administrator should have at least a bachelor level degree with two or more years of relevant experience as an IT professional in Windows networks managing monitoring tooling. Preferably the monitoring tool administrator has the following or equivalent certification: Technology Specialist: Microsoft System Center Configuration Manager 2007 ⁵

⁵ <http://www.microsoft.com/learning/en/us/exam.aspx?ID=70-400&locale=en-us>.

4.5. FUNCTIONAL ADMINISTRATOR

The functional administrator is the link between the BizTalk Server administration team, the BizTalk Server development team, the business and internal and external application administrators. He should have a high-level understanding of how the BizTalk Server infrastructure works and the messaging patterns in the BizTalk Server infrastructure. Furthermore he should know how the BizTalk Server infrastructure interoperates with business processes.

4.5.1. ACTIVITIES

- Monitor message traffic
- Stop and start message flows
- Recover terminated messages and resubmit them to the front-end or back-end system
- Communicate with application administrators of internal and external applications
- Monitor messaging performance
- Anticipate on future performance requirements

4.5.2. LEVEL OF KNOWLEDGE

The functional administrator should have at least a bachelor level degree with two or more years of relevant experience as a functional administrator. Furthermore the functional administrator should have a thorough understanding of how the BizTalk Server infrastructure interoperates with the organization's business processes.

4.6. NETWORK ADMINISTRATOR

In every IT-infrastructure networking plays an important role. The team of network administrators is responsible for ensuring all network connectivity in the BizTalk Server infrastructure.

4.6.1. ACTIVITIES

- Monitor network traffic
- Configure networks
- Configure and maintain routers and switches
- Configure and maintain firewalls
- Configure and maintain load balancers
- Resolve tier-2 and tier-3 networking incidents
- Solve networking problems

4.6.2. LEVEL OF KNOWLEDGE

The Network administrator should have at least a bachelor level degree with two or more years of relevant experience as a network administrator.

5. CONCLUSION

Managing and operating a Microsoft BizTalk Server infrastructure can be a challenging task. The team responsible for this needs both specialized as well as broad knowledge in the matter. The team should consist of the following roles:

- Windows Server administrator
- Database administrator
- Network administrator
- BizTalk Server administrator
- Monitoring tool administrator
- Functional administrator

Of course, depending on the size of your IT-organization people could have multiple roles. In larger organizations the role can include multiple persons. E.g. the BizTalk Server administration team can consist of more than one person.

The team plays a role in the following ITIL processes:

- Operations Management
- Application Management
- Platform Management
- Incident Management
- Problem Management

This white paper is intended to give insight in what is needed to properly manage and operate a Microsoft BizTalk Server infrastructure. Hopefully it helps you in setting up your BizTalk admin team or to further improve your team. If the team is set up correctly your Microsoft BizTalk Server infrastructure will be more reliable with higher availability and lower risk of data loss. With the right team your Microsoft BizTalk Server infrastructure will work like a charm.

6. CONTACT

Would you like more information or need advice?

Contact us to plan a meeting: sales@codit.eu | www.codit.eu | www.codit.eu/blog

7. GLOSSARY

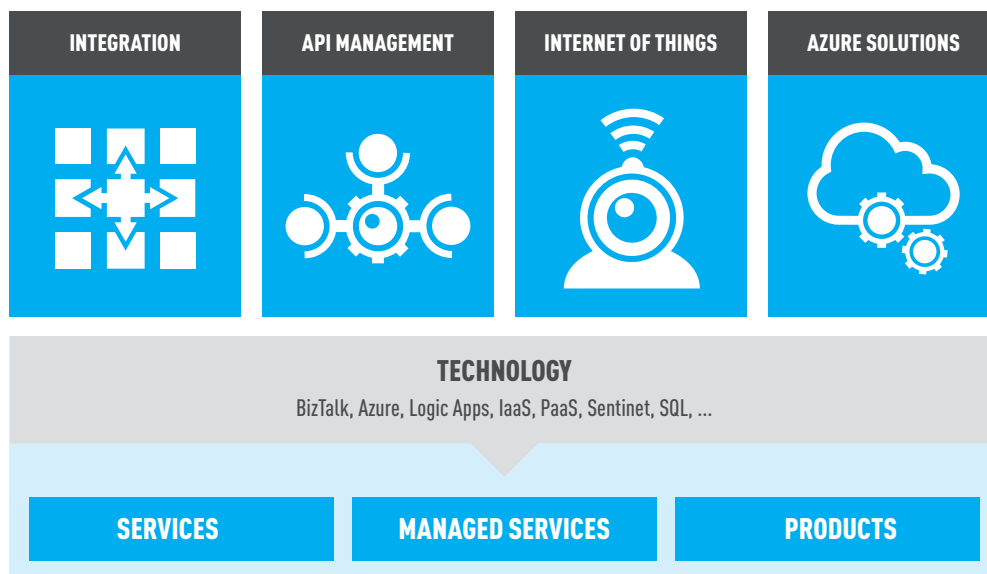
Term	Definition
Event	A record describing a change of state which has significance for the management of a Configuration Item or service. The term Event is also used to mean an alert or notification created by any IT service, Configuration Item or monitoring tool. Events often require IT operations personnel to take actions, and may lead to Incidents being logged. ⁷
Hotfix	A package that contains one or more files that are used to address a problem (bug) in a software product.
Incident	An Incident is defined as an unplanned interruption or reduction in quality of an IT service (a Service Interruption). ⁸
ITIL	The Information Technology Infrastructure Library (ITIL), is a set of practices for IT service management (ITSM) that focuses on aligning IT services with the needs of business. ⁹
MSDTC	The Distributed Transaction Coordinator service is a component of Microsoft Windows that is responsible for coordinating transactions that span multiple resource managers, such as databases, message queues, and file systems.
Network Load Balancing (NLB)	NLB is intended to provide high availability and high reliability, as well as high scalability for applications with relatively small data sets that rarely change and do not have long-running-in-memory states.
Security patch	A package that contains one or more files that are used to solve a security problem (bug) in a software product.
Service pack	A service pack is a set of Security patches, hotfixes and/or enhancements to a software program delivered in a single installable package.
Virtualization	Virtualization is the creation of a virtual version of something, such as a hardware platform, operating system, etc.
Windows failover clustering	A failover cluster is a group of independent computers that work together to increase the availability of applications and services and is intended to provide high availability and high reliability.




⁷ Source: http://wiki.en.it-processmaps.com/index.php/Event_Management

⁸ Source: http://wiki.en.it-processmaps.com/index.php/Incident_Management

⁹ Source: http://en.wikipedia.org/wiki/Information_Technology_Infrastructure_Library

connecting ^(is) everything



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