

A New Generation of
Network Fax Software
That Moves Information
and Powers Business

FA CORE
WHEN EVERY FAX IS MISSION CRITICAL

Designing and implementing a Fault Tolerant fax server

Faxes are as important today as anytime in the past. Documents that are faxed typically initiate and confirm business and legal transactions. If your fax server is out of commission, your business suffers. Taking steps to maximize the uptime of a fax server is just smart business. Designing a Fault Tolerant or Fault Resilient fax server is the topic of this paper.

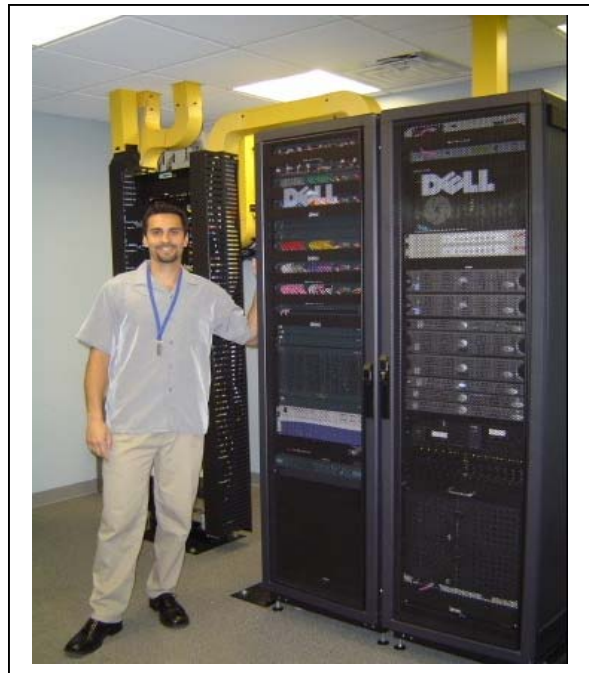
While both offer layers of security, there is a difference between integrating fault tolerance versus fault resilience into any technology platform.

Fault tolerance – a design methodology aimed at surviving component failures – is becoming a necessity for a growing number of companies as they place increasing reliance on computer systems for the very survival of their business. Computer applications become ever more complex, yet they are often built from unreliable components, hardware or software.

Distinguishing fault tolerance from fault resilience can be tricky. Fault tolerance is the stronger term, indicating that every component in the chain supporting the system has redundant features or is duplicated. In the event a component fails, another is available to keep the system operational.

Fault tolerant systems should also provide recovery from multiple failures. Components are often over engineered or purposely underutilized to ensure that while performance may be affected during an outage, the system will perform within predictable and acceptable parameters.

Alternatively, fault resilience usually indicates that at least one of the services or modules within an application, such as a fax board, is backed up with a secondary fax board within the same server, or a separate server. However, not all modules within the application are necessarily redundant. For instance, the fax server may have multiple fax



boards but only one Rendering engine for document conversion. Performance of the system during a failure of a single module is therefore undefined. One fault-resilient component does not make the system fault tolerant.

Fault tolerance, fault resilience and disaster recovery are intimately interrelated. An understanding how they work together is required in order to design a fault-tolerant fax server. Simply put, the goal is to keep the fax server running no matter what the conditions (or lack thereof), to maximize the number of failures the system can cope with, and to minimize any potential weaknesses.

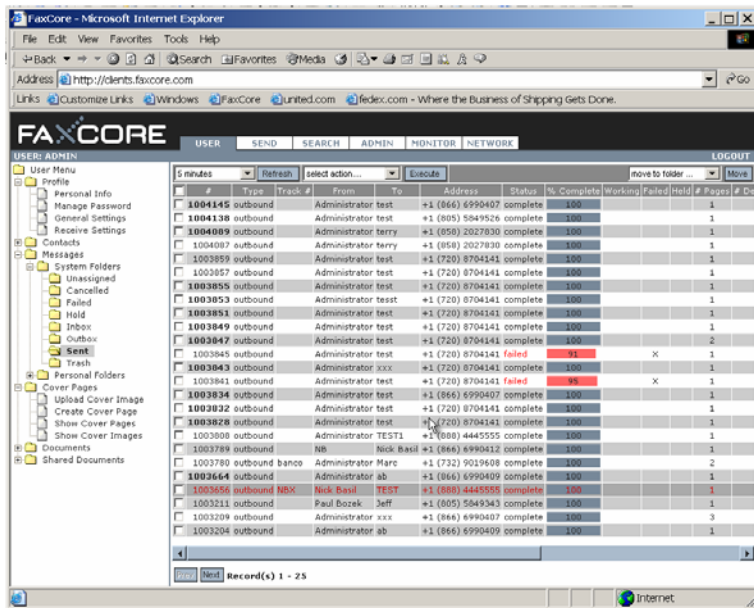
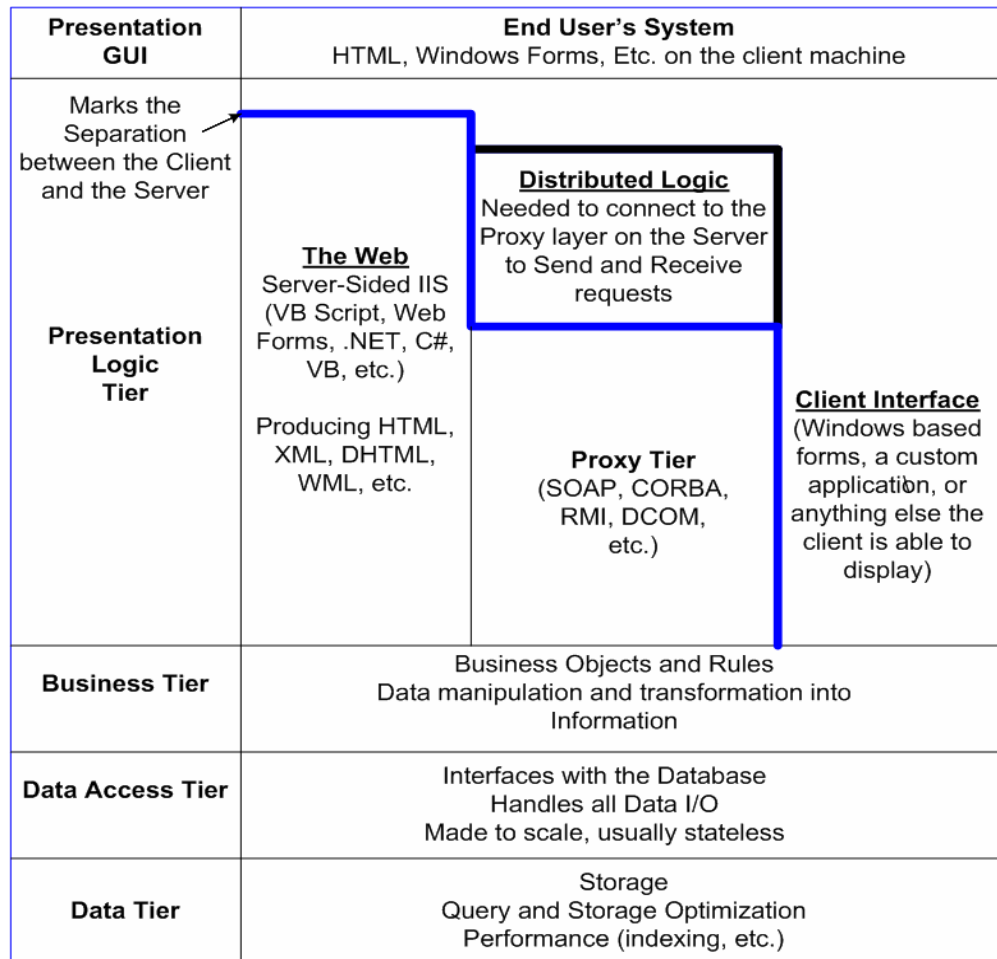
Fault Tolerance or Fault Resilience?

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N-Tier Architecture

For one company looking to implement a fault tolerant fax server, the first task was to find a product built on Microsoft .NET with an N-Tier Architecture. N-tier applications have become the norm for building enterprise software today. To most people, an N-tier application is anything that is divided into discrete logical parts. The most common choice is a three-part breakdown—presentation, business logic, and data—although other possibilities exist. N-tier applications first emerged as a way of solving some of the problems associated with traditional client/server applications, but with the arrival of the Web, this architecture has come to dominate new development.

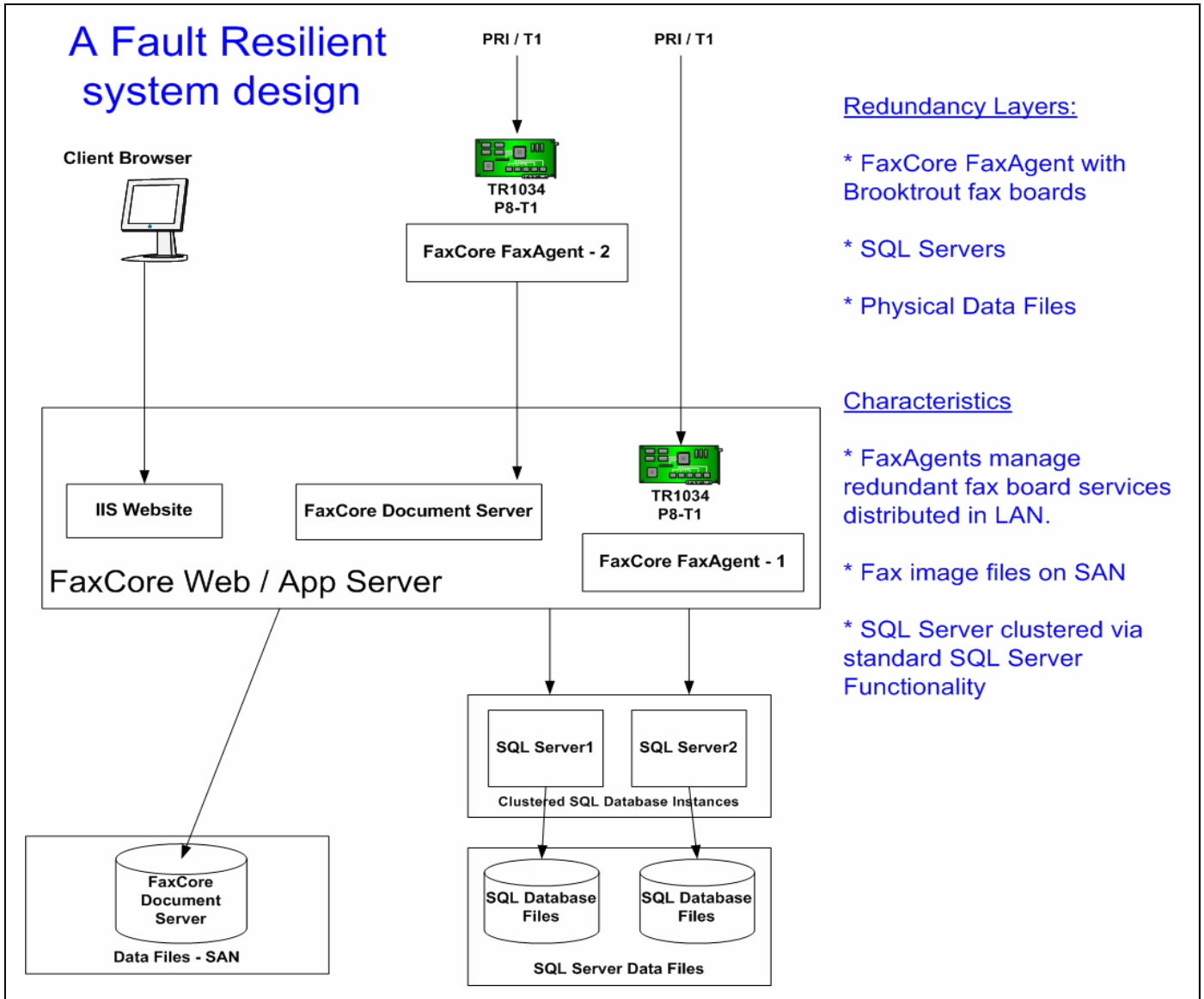


- Microsoft .NET is a Microsoft Windows component used to build and run next generation applications and XML web services.
- The .NET environment supports conventional N-Tier applications, Web services applications, and applications that contain both elements.
- .NET also eliminates the need for a Windows fat client since ASP.NET Web controls simplify the building of usable browser clients.
- The ability to download .NET Framework-based components to Internet Explorer clients and have them run with partial trust makes for a better user interface.

The following diagram illustrates a Fault Resilient design.



Another aspect of a fax server that is worth making fault tolerant is the fax image repository. Creating a cluster resource and defining the FaxCore Document Server provides uninterrupted access to sent and received faxes as well as a consistently available repository for storing incoming fax transmissions. A Fault Resilient system can be achieved by using a SAN or a PowerVault Attached storage array.



Redundancy Layers:

- * FaxCore FaxAgent with Brooktrout fax boards
- * SQL Servers
- * Physical Data Files

Characteristics

- * FaxAgents manage redundant fax board services distributed in LAN.
- * Fax image files on SAN
- * SQL Server clustered via standard SQL Server Functionality

CONCLUSION

Industrial strength servers and infrastructures are important components of an “always available” system. The architecture of an application is just as critical. An application with a Client-Server architecture requires expensive and complicated clustering in order to deliver Fault Tolerant operations. Applications that are built on .NET and implement an N-Tier architecture can provide Fault Tolerant operations and load balancing by simply adding PCs to run specific processes.



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