

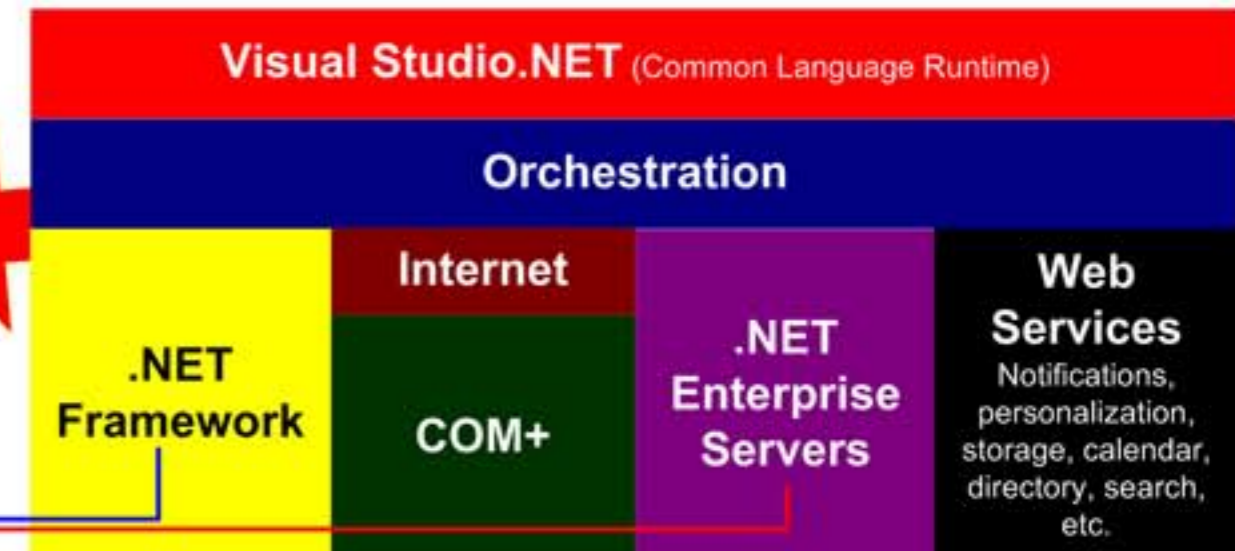
.NET Framework

Web Services ASP.NET
Applications that can be integrated with others through HTTP, XML and XMLP. Web controls encapsulating common Hypertext Markup Language UI controls. Browser independence!

ADO.NET Base Classes CLR
Web Forms, Page Events, Server/User controls, Data binding, Compiled Lang. support. New generation of ActiveX Data Object technology, XML in-memory cache. Unified, object-oriented, hierarchical extensible set of class libraries. Common Language Runtime. Manage memory, resources e.g. threads and processes, security, etc. Managed Code == code that targets CLR managed services

Technologies

WWW ... World Wide Web Services
FTP ... File Transfer Protocol
SMTP ... Simple Mail Transfer Protocol
XMLP ... eXtensible Markup Language
ASP.NET ... allows all browsers to make use of component functionality as processing occurs on web server.
ADO.NET ... encapsulates OLEDB
COM+ ... architecture for distributed application development by encapsulating business and data logic.
- transactions
- queued component services, etc.



.NET Servers

Internet Security and Acceleration Server 2000
Application Center 2000
Commerce Server 2000
SQL Server 2000
BizTalk Server 2000

Secure Internet Connectivity, Fast Web Access
Application Management, Software Scalability (load balancing, NLB, COM+ CLB), Availability
Business Pipelines, Catalogs, Profile System, Business Analysis (data aggregation)
XML, Direct Web access to data, stability, Data Warehousing, Data Analysis (OLAP cubes)
Dynamic Process Orchestration, Partner Application Integration, Interoperability, Scalability, Document Tracking and Analysis
Messaging, Web Storage System, Collaboration and Workflow
Host Access, AS/400 and hosts, 30000 simultaneous host sessions per server
Outlook Mobile Access, Mobile Services and Solutions

Exchange Server 2000
Host Integration Server 2000
Mobile Information Server 2000

Asynchronous Operations

- >> Different application running times
- >> Disconnected mobile users
- >> Server downtime ... effective handling
- >> Workflow, log maintenance, updates of slowly changing data
- >> Rudimentary load balancing

MSMQ

- Integral part of Windows 2000
- Optional receipt on delivery or expiry
- COM+ Queued Component support
- Ports:

TCP: 1801
RPC: 135, 2101, 2103, 2105
UDP: 3527, 1801

Loosely Coupled Events (LCE)

- COM+ Publisher
- COM+ Subscriber
- COM+ Event Class (connector)

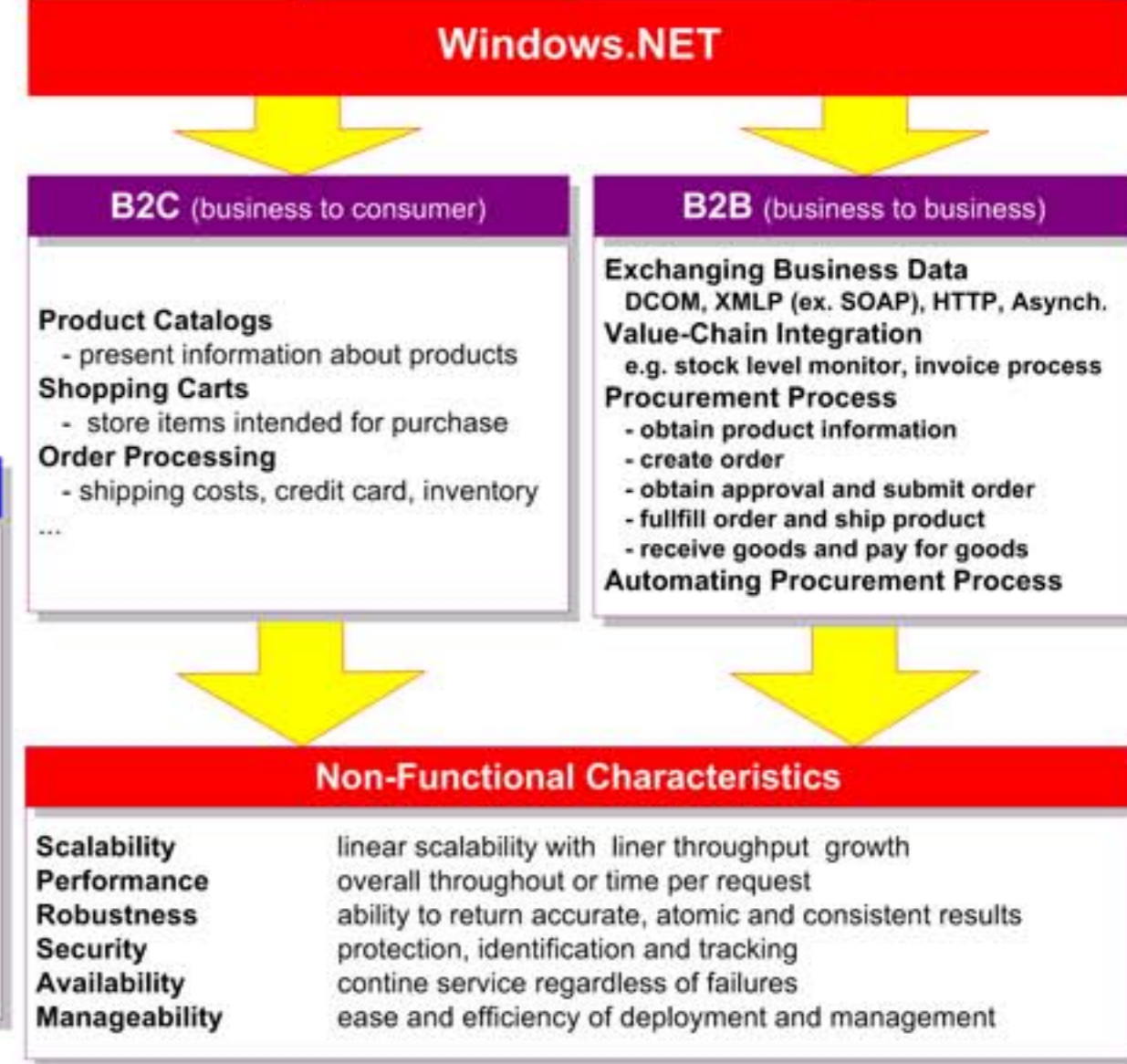
Security

- Firewalls
- Network Segregation
- Auditing
- Cryptography
- Authentication
- Access Control
- System Integrity
- Active Directory
- COM+ Roles
- NTLM
- NTFS
- LDAP
- IPSec
- HTTPS
- SSL



Protocols

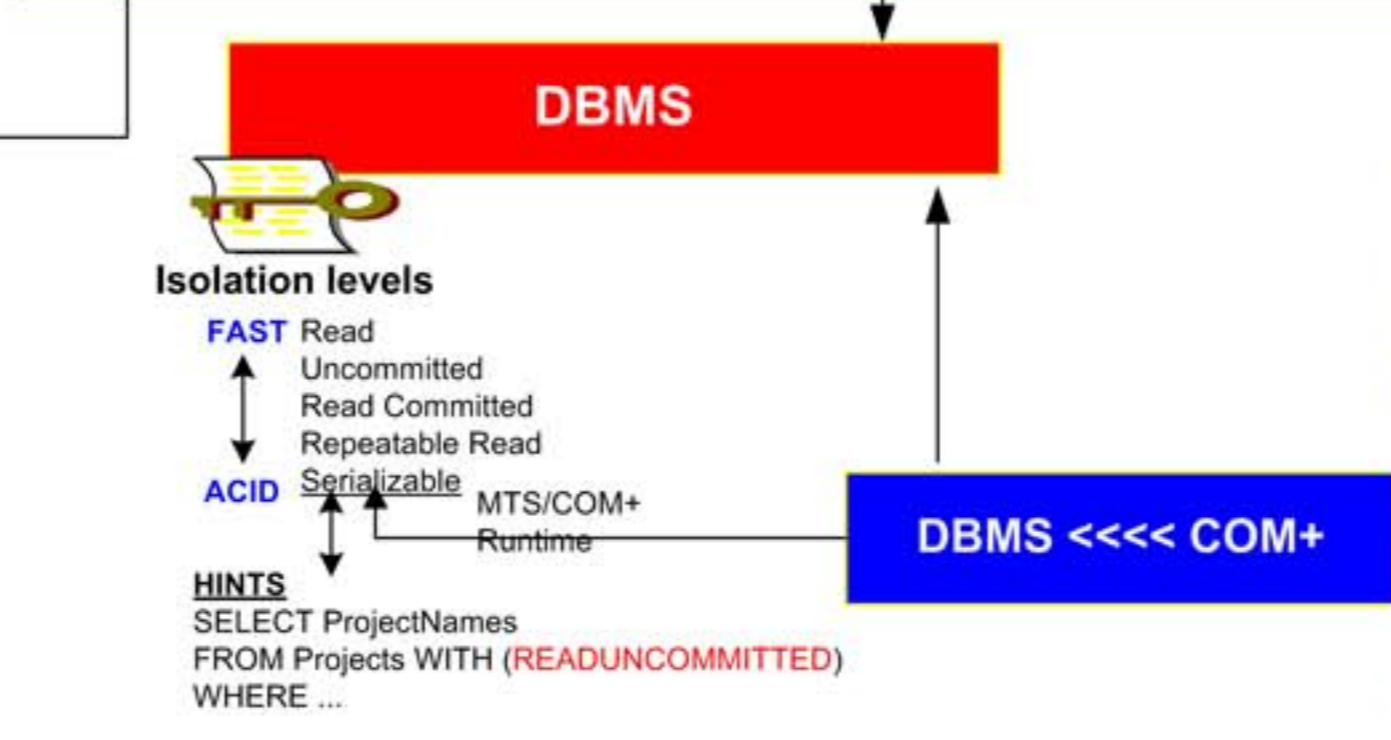
- Hypertext Transfer Protocol (HTTP) : standard lightweight application protocol
- File Transfer Protocol (FTP) : Protocol for transferring files.
- Simple Mail Transfer Protocol (SMTP) : Sent info as an e-mail with server, i.e. Ex2000
- Distributed Component Object Model (DCOM) : Distributed objects, "COM on the wire"
- Microsoft Message Queue Server (MSMQ) : Guaranteed transactional asynch. comms.
- eXtensible Markup Language Protocol (XMLP) : RPC-type calls as XML message over HTTP : Ex-SOAP



DBMS Best Practices

- Only use stored procs
- Use role based security
- Keep transactions narrow
- Before running statements be sure to set required isolation level, default is serializable change to read committed
- Use Integrated Security
- Avoid using Extended Stored procedures
- Rather have a fat SQL Server than client
- Use "page concept" for returning result sets
- Keep row lengths (size) less than 4092KB
- Aim at maintain a server for reporting purposes and another for transactionality.
- In intensive read or write environments make the effort of using filegroups.
- Don't rely on hardware performance to handle unlimited history, rather send that to an archive database.
- Avoid dynamic SQL
- Avoid queries without WHERE clauses
- Avoid using NOT, <>, LIKE statements.

BEST PRACTICES



GENERAL

SCALABILITY ... new load ... liner resource increase

Intra-Machine resources Limit usage of threads, memory, handles, etc.

Intermachine resources Distribute processing to available machines

Client affinity Avoid state dependencies
Server affinity Application depends on specific servers
Object lifetime Short lifetime, pooled for resource heavy components
Component grouping Group time-dependent & time-independent services.

AVAILABILITY ... Tolerate failures

Failures should be transparent to client
Cater for hardware and software failures
Critical logic uses transactions
Retry on failure logic
Application restarts, unhandled exceptions ... unacceptable and avoidable.
Graceful degradation ... no fizz, smoke, bang.

Windows Clustering
Fail-over support
Consistent data and state availability

Network Load Balancing
Load balance incoming IP requests across a server cluster.

FAST COMMUNICATION ... Action List

- Minimize cross-process calls
- Minimize cross-machine calls
- Minimize messaging between components
- Use JIT, pooling
- Use DSN object constructor, not File DSNs.

Mapping from SQL Server Data Types to XML Data Types

bigint	i8	decimal	r8	nchar	string	smalldatetime	datetime	timestamp	ui8
binary	bin.base64	float	r8	ntext	string	smallint	i2	tinyint	ui1
bit	boolean	image	bin.base64	nvarchar	string	smallmoney	fixed.14.4	varbinary	bin.base64
char	char	int	int	numeric	r8	sysname	string	varchar	string
datetime	datetime	money	r8	real	r4	text	string	uniqueidentifier	uuid

