



Smart Client Communications with the Middle Tier

Brian Noyes
IDesign, Inc. (www.idesign.net)
brian.noyes@idesign.net

Ride the wave

About Brian

- Principal Software Architect, IDesign Inc. (www.idesign.net)
- Microsoft MVP in ASP.NET
- Writing
 - MSDN Magazine, CoDe Magazine, The Server Side .NET, asp.netPRO, Visual Studio Magazine, .NET Developers Journal
 - Data Binding in Windows Forms 2.0, Addison-Wesley, expected release Fall 2005
- Speaking
 - Microsoft TechEd US and Malaysia, Visual Studio Connections, VSLive!, DevEssentials, INETA Speakers Bureau, MSDN Webcasts
- Participates in Microsoft Design Reviews
- Email: brian.noyes@idesign.net
- Blog: <http://www.softinsight.com/bnoyes>



Ride the wave

Agenda

- What is a Smart Client?
- Options for middle tier communications
- Smart Client communications concerns
- Comparing the options
- Application Block Support



Ride the wave

What is a Smart Client

- Rich user interface (Windows Forms)
- Connects to back-end services
- Runs securely on the client
- Supports auto-deployment and update over the network
- Supports disconnected operations



Ride the wave

Agenda

- What is a Smart Client?
- Options for middle tier communications
- Smart Client communications concerns
- Comparing the options
- Application Block Support



Ride the wave

Smart Client Communications

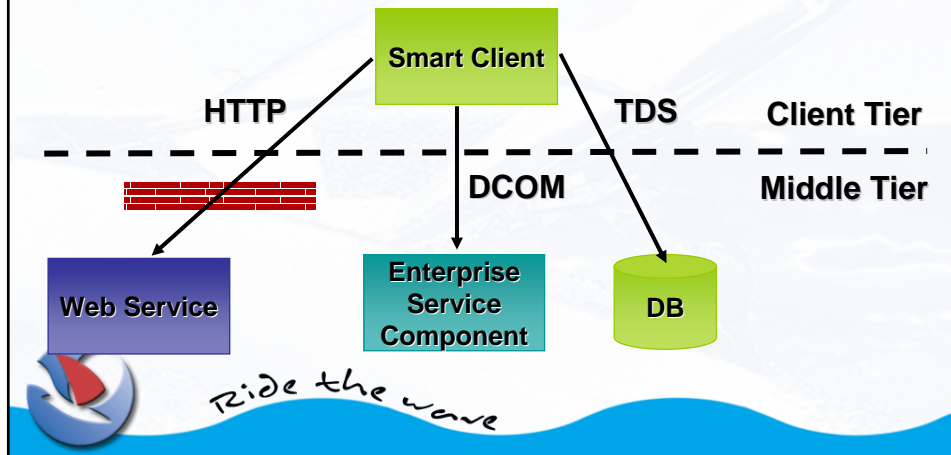
Options

- Database
- .NET Remoting
- MSMQ
- Enterprise Services (COM+)
- Web Services
- Indigo



Ride the wave

Communications Protocols



Agenda

- What is a Smart Client?
- Options for middle tier communications
- Smart Client communications concerns
- Comparing the options
- Application Block Support



Communications Concerns

- Calling Patterns
- Disconnected Scenarios
- Data Caching and Concurrency
- Security
- Versioning



Ride the wave

Calling Patterns

- Network latency is the enemy
- Avoid “chatty” calling patterns
 - Few, large parameters vs. many small parameters
- Messages or structures, not object refs
- Plan for failure
- Call asynchronously



Ride the wave

Disconnected Scenarios

- Connection status detection
- UI adaptation for disconnected status
- Modify operations based on connection
- Local data caching needed
- Data synchronization needed



Ride the wave

Data Caching and Concurrency

- Avoid unnecessary round trips
- Cache locally for disconnected scenarios
- Always favor optimistic concurrency
 - Be prepared for violations
 - Provide conflict resolution mechanisms



Ride the wave

Security

- Firewall may block needed ports
- Authentication and authorization is vital
- Input validation – client & server
- Sensitive data protection
- Need client protection from malicious code
 - Code Access Security



Ride the wave

Versioning

- Need to keep client and middle tier components compatible
 - Different interfaces / APIs
 - Version detection
 - Automatic updates
 - Permissible method parameters



Ride the wave

Agenda

- What is a Smart Client?
- Options for middle tier communications
- Smart Client communications concerns
- **Comparing the options**
- Application Block Support



Ride the wave

Comparing the options

Database

- Proprietary Protocols
- Firewall Concerns
- Security Concerns
- Encourages poorly layered design
 - Tight coupling between client and back-end
 - Can be remedied by deploying business layer and data layer components to client
- Small / simple CRUD apps only



Ride the wave

Comparing the options

.NET Remoting

- Simple
- Fast
- Firewall concerns
- Security concerns
- Tight coupling between client and middle tier
- Good for cross-AppDomain/process on same machine
- Obsolete in Indigo arena
- Avoid for Smart Client to middle tier



Ride the wave

Comparing the options

MSMQ

- Fast
- Inherently asynchronous and loosely coupled
- Proprietary
- Tightly coupled to the technology and between tiers
- Complicated coding patterns
- Avoid for Smart Client to middle tier



Ride the wave

Comparing the options

Enterprise Services

- Fastest / Secure
- Provides additional services including queued components (asynchronous)
- Tightly coupled client and server
- Firewall crossing difficult
- Complicates development / deployment slightly
- Best code migration path to [Indigo](#)
- Most powerful option inside the enterprise



Ride the wave

Comparing the options

Web Services

- Easy / Flexible
- Loosest coupling between client and server
- Lowest performance option
- Security not built in (today)
- Best option for widely distributed clients or those requiring loose coupling



Ride the wave

Comparing the options

Indigo

- Combines remoting capabilities of .NET Remoting, Web Services, Enterprise Services, MSMQ
- Single declarative programming model
- Configuration and provider model to determine underlying communications and service providers
- Very powerful / Much easier to use



Ride the wave

Agenda

- What is a Smart Client?
- Options for middle tier communications
- Smart Client communications concerns
- Comparing the options
- **Application Block Support**



Ride the wave

Application Block Support

- Offline Application Block
- Updater Application Block (v2)
- Caching Application Block (Enterprise Library)
- Asynchronous Application Block
- Aggregation Application Block

- Get them at:

<http://www.microsoft.com/patterns>



Ride the wave

Summary

- Many options to pick from
- Enterprise Services inside the firewall for best performance + capabilities (services)
- Web Services for maximum flexibility, interoperability, and reach
- Future: Indigo for everything!
- Design for remoting early
- Email: brian.noyes@idesign.net
- Blog: <http://www.softinsight.com/bnoyes>



Ride the wave