

Smart Client Communications with the Middle Tier

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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
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Agenda

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



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



Agenda

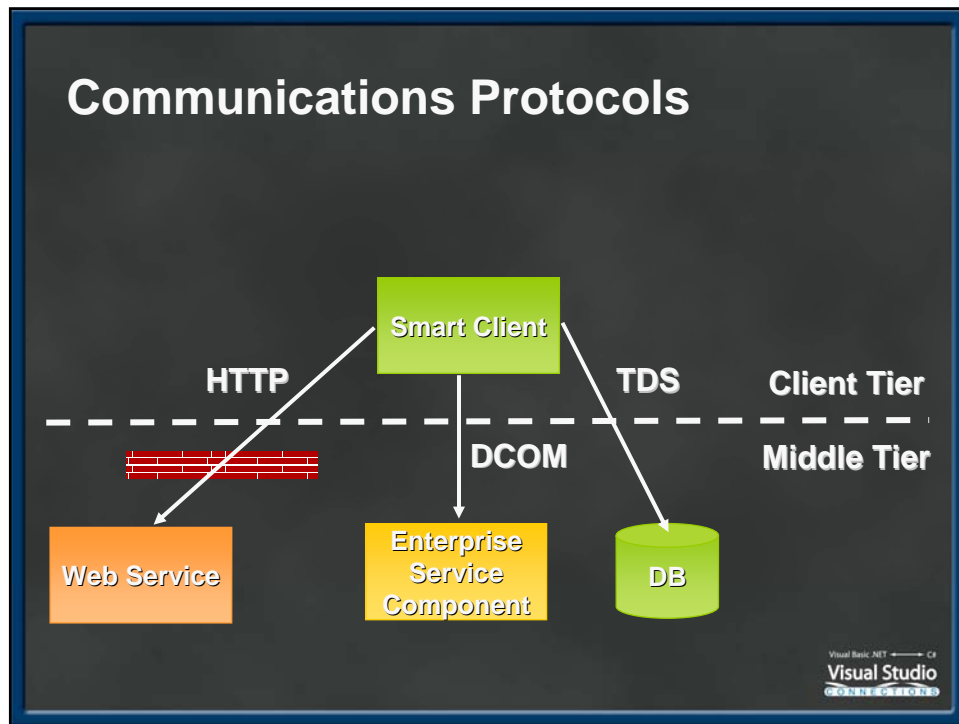
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Smart Client Communications Options

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





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Communications Concerns

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



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



Disconnected Scenarios

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



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



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

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Visual Studio
Connections

Versioning

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

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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

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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
- **Avoid for Smart Client to middle tier**

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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**

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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

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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

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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



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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>



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
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