SCO Forum 2006

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Presentation Title: **EdgeClick Programming Approaches for Access to Corporate Data**
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Session ID: **124**

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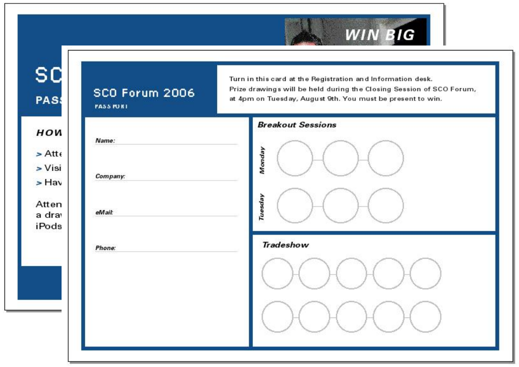

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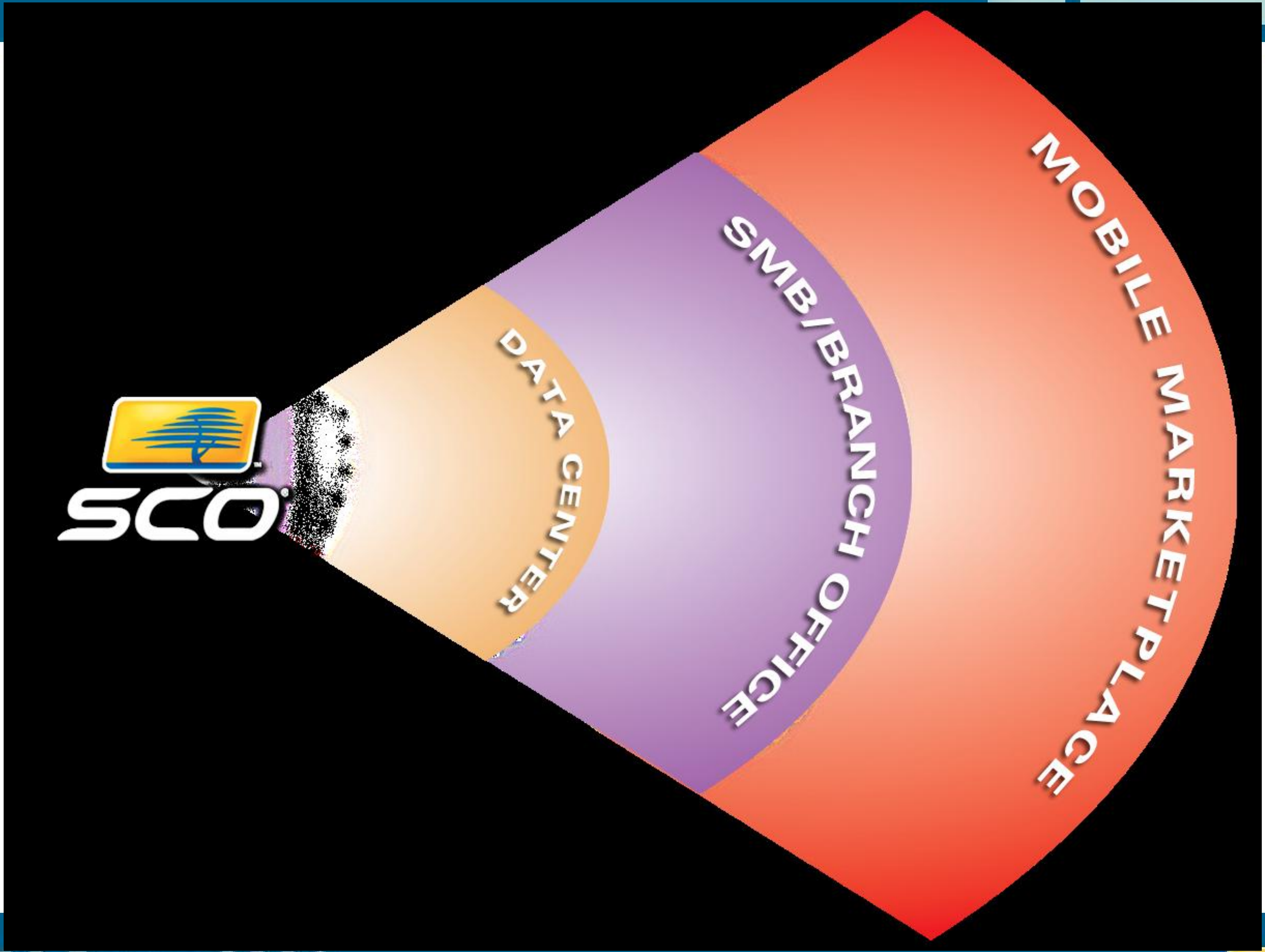

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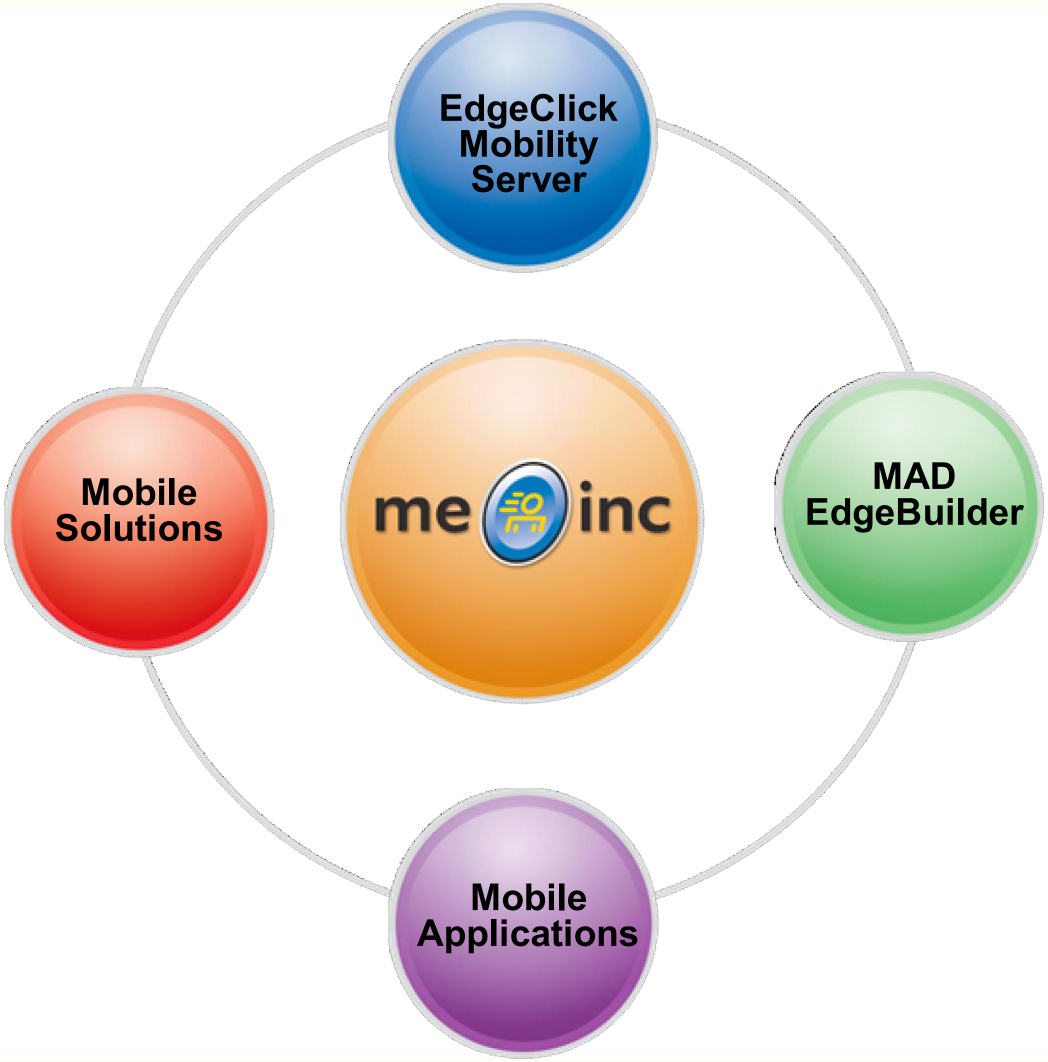


Goal

- Almost all EdgeClick applications need to access existing data
  - Self-contained applications need subscriber data
  - Business integration applications need business data
  - Monitoring applications need data feeds
  - Mobile database applications need to synchronize

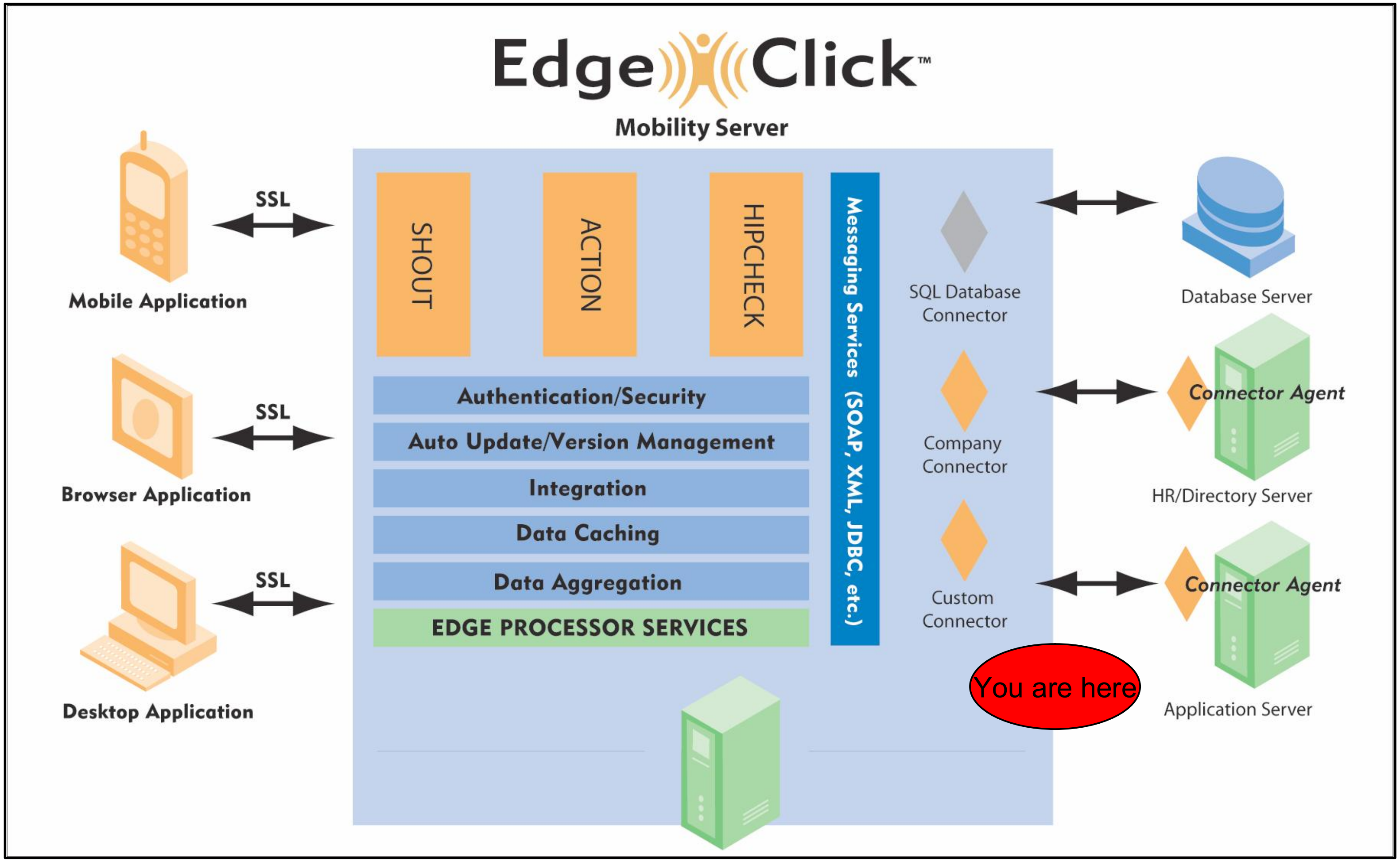
- There are lots of solutions
  - We'll discuss some ones we've seen
  - There are no doubt others

EdgeClick™

Agenda

- Connectors vs. Agents
- Connector technology choices
- Agent technology choices
- Samples that exist
- Security and firewall issues
- Future directions

EdgeClick Architecture



“Connectors” vs. “Agents”

- EdgeClick terminology for components that access existing corporate data
- “Connectors” are code that runs on the EdgeClick Processor (Mobility Server) and accesses external systems
- “Agents” are code that runs on external systems and communicates with the EdgeClick Processor
- It’s possible to have either, both, or none for a given EdgeClick mobile digital service

Connector technology choices

- All depends upon what interfaces exposed by existing outside corporate application
- Also depends upon how frequently information needed, etc.

- What follows are some examples that we’ve seen

Connector possible approaches

- SOAP Web Services
  - Perfect if corporate app has existing WS interface
  - Tools do a lot of the work
  - Useful if need to communicate through intermediary service, to handle firewalls or key system isolation
  - MS Information Bridge Framework further enhances
- REST
  - A web services variant using XML and HTTP POST
  - Some prefer it to SOAP due to simplicity
  - Requires XML knowledge

Connector possible approaches

- XML document interchange
  - Socket programming using XML but not SOAP
  - Useful for document-centric applications
    - XML Schema is optional, depends upon circumstances
  - Useful for apps that accept XML import/exports
    - Some apps “got on board” XML but not Web Services

Connector possible approaches

- HTTP
  - Quick to do if corporate app already has a web browser transactional interface
  - Simply replicate its GET/POST transmissions, but from ECP instead of a browser
  - May pass name-value pairs, XML, etc.
  - Also likely bypasses any firewall issues

Connector possible approaches

- JDBC
  - Direct remote database access
    - MySQL J/Connector an example
  - Easy if available
  - Beware “logical rows != physical rows”
    - Sometimes application logic surrounds database layout
    - Can’t hit database directly
  - Lots of Java mappings above JDBC
    - EJB3 Persistence
    - O/R mappers
    - …

Connector possible approaches

- Formal connectors and adaptors
  - Good for tight coupling
  - JCA (Java Connector Architecture)
    - Maps J2EE security/transactions/communications to EIS analogue
    - Plugin adapter interface
      - Contract between adapter and application server
      - Contract between adapter and "client" (other side)
    - JDBC - example of JCA in use
  - MS BizTalk Server
    - Business Adapters

Connector possible approaches

- Messaging
  - Good for loose coupling
  - JMS (Java Message Service)
  - ESB (Enterprise Service Buses)
  - MS BizTalk Server

Connector possible approaches

- Periodic update solutions
  - Live update may not be appropriate
  - Live update may not be necessary
  - Corporate data can be periodically accessed
    - Download into ECP cache
    - Download into phone database
  - ftp, socket programming, various mechanisms …
  - CSV or other formats …

Agents technology

- EdgeClick standard approach is to use SOAP-based Web Services
- Language neutral, OS neutral
- Looks like normal language procedure calls
- Best for legacy application integration
  - Static app semantics map well to formal WSDL contracts
- Arbitrarily sophisticated
  - WS-* standards
- Many implementations available
- SCO Unix:
  - Support in SCOx packages for Java, C, C++, Perl, PHP

Agents example

- Meter service in EdgeBuilder SDK
  - Located at …\sdk\agent\samples\MeterAgent\
  - Accepts "meter readings" and deposits them in flat files according to "billing center"
  - Since using SOAP, MeterAgent must be built before MeterService
    - Agent code publishes WSDL
    - Service build generates stubs from agent WSDL
    - Service code calls those stubs

How to use SOAP with agents

- Calling out from ECP service to agent
  - The most frequent case
  - Can use well-known Apache Axis implementation
    - axis.jar etc. libraries, wsdl2java command, etc.
    - Advantageous if already experienced with it
    - JBoss doesn’t “know” about Axis, but for outbound calls it doesn’t matter
    - Avoids newly-created JBossWS web services stack
      - Potential interoperability problems with agent Axis, .NET, etc.
    - This is what MeterService sample code does
    - Must include Axis jars in your edgeclick service .ear manifest

How to use SOAP with agents (cont’d)

- Receiving calls in ECP initiated by agent
  - Happens with monitoring application “alerts”
  - Cannot use Axis
    - JBoss doesn’t know how to hand calls off to it
  - Must use JBossWS
    - standard JSR-109, JSR-181 interfaces
    - @WebService Java annotations
  - Can mix this with Axis outbound calls

Advanced Agents

- Agents can encapsulate complex back-end needs
  - Multiple data sources
  - Aggregation, federation
  - Transactional logic
  - Commit-or-rollback semantics
- Interoperability efforts
  - Sun-MS "Project Tango"

Security issues

- What level of security is needed between EdgeClick Processor and back-end corporate applications
  - Up to each application designer
  - Trade-off between secureness and ease-of-development
- Use https rather than http
- Use cross-signed certificates between ECP and back-end system
- Service checking
  - Pass authentication info (name/password) to back-end system
  - Authenticate any incoming calls from agent
- Or agent checking
  - Just validate agent belongs there
  - Not subscriber-specific

Firewall challenge

- The EdgeClick Processor runs outside an enterprise's firewall
  - True when hosted by SCO
  - True when deployed by reseller or corporate customer
- Existing corporate back-end servers run inside an enterprise's firewall
  - True for almost all production situations
  - Cannot access systems' ports 80/8080/etc. directly
  - Brokers calls and calls to agents are blocked

Firewall solution

- EdgeClick's Proxy Relay Agent Service is the solution
  - Runs on system just inside the enterprise firewall
  - Accepts EdgeClick Processor broker and agent calls through one dedicated firewall opening
  - Forwards them to all the back-end systems
  - Not yet productized

Future directions

- Improved Connector interfaces
  - Easy plug-in of corporate-specific subscriber module
    - implement *ITeam*
    - interface to HR DB and the like
  - Management of application-specific modules
    - Register connectors with ECP
    - Be able to meter back-end connections
    - Input to billing, business model
- Improved Agent interfaces
  - Same ideas re management of agents
- Generic store-and-forward service in ECP

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Q & A

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