

OA Strike Team: Open Source Architecture for OA

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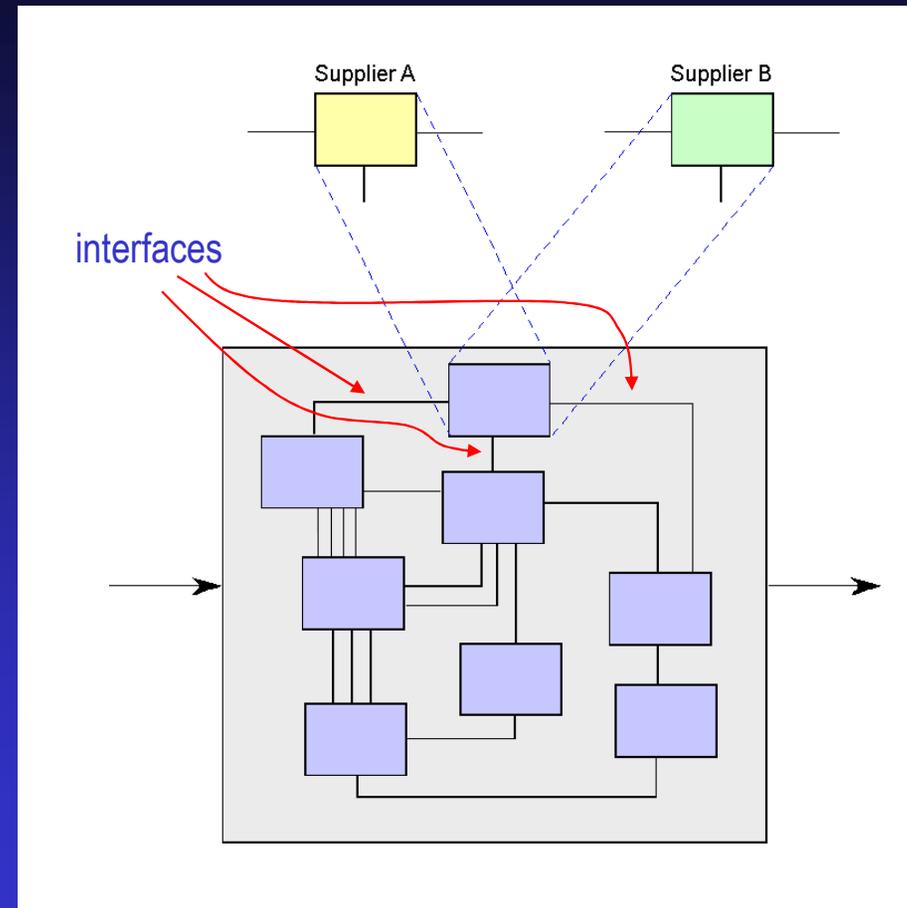
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Focal Points

- OA Mission
- OA Goals as Implemented by PSC/ARCI
- Common HW/SW IPTs
- Shared Source Repository

What does being *open* do for us?

- With an open modular system the interior components of the system are visible
- We can now replace parts
 - At a minimum, interfaces must be “published”
 - *Better situation* - interfaces are standard across a specific community of users (e.g., Navy, DoD,...)
 - *Best situation* - interfaces are widely-used commercial standards



Progeny Open Architecture Approach

- Common Core Open Architecture (CCOA) Represents the Recommendations of Navy Open Architecture
 - Standards Based Infrastructure Components
 - Enables Component Based Architecture
 - Software Components Interconnected by Interface Standards to be Re-Usable
 - Enabling Technology That Provides Portability of Components Across Domains
- CCOA Takes the Next Step: Shared Source Infrastructure Components
 - Standards Based
 - Open Source Model Provided to Community of Interest
 - Not Publicly Available; Controlled Access
 - Freely Available to Developers Within The Community of Interest
 - Technical Reasons
 - Information is Available to Enable Integration
 - Better Product Through Community Development
 - Business Reasons
 - Avoid Vendor Lock-In
 - Affordable Technology Refresh and Insertion

Must Retain the Internet's OA Philosophy, "All Information Needed Regarding Interconnection Aspects is Publicly Available"

“Open Architecture in a Box” - Software Infrastructure



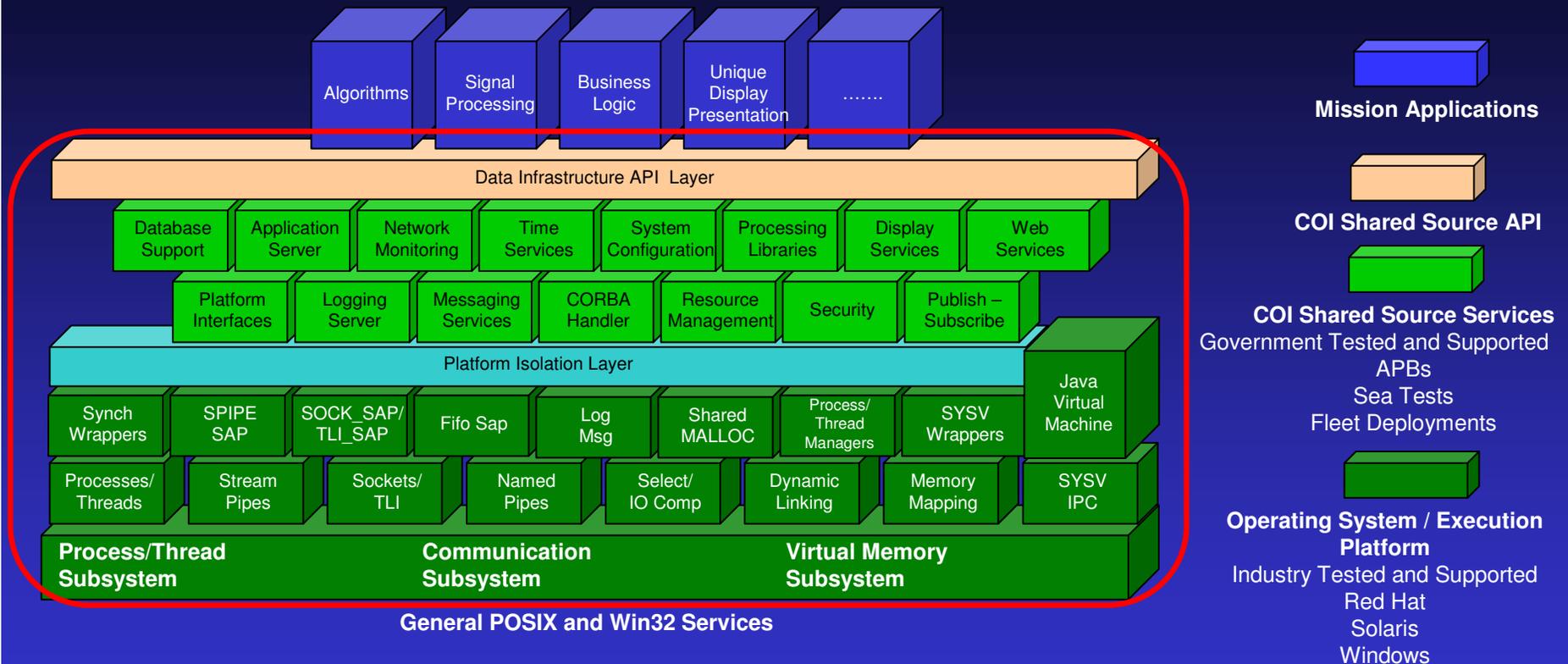
- Development Tools
- Collaboration Tools
- Runtime Environment (s)
- Middleware (s)
- Data Exchange & Interoperability Tools
- Supports Forcenet and GIG Compliance

Uses ARCI Technologies To Support The Cross Domain OA Initiative

OA In a Box Concepts In Action

- ARCI / VA Have Been Identified as “Model” OA Programs
- A Progeny Component (AI&R / WLY-1) Has Been Put Under Test
 - Last Year Surveillance Integrated Core Processor (ICP) Asked to Use AI&R for their Sensors
 - ICP Needed HF Capability, and had Defined External Interfaces
 - Progeny Tasked to Integrate AI Capability into ICP
- Target System Has OA-Compatible Architecture (CORBA, Java)
 - We Used OA Website Components to Integrate with ICP
- OA Model Proven Out
 - Ported From VME to Intel Server Architecture in < 1 Month
 - AIS (Variant) Completed Early, Under Budget
 - Little or No Impact to Core AI&R Processing
 - Bulk of Work Was Satisfying External Interface Requirements
 - New Improvements in AI Baseline Transferable to ICP Seamlessly

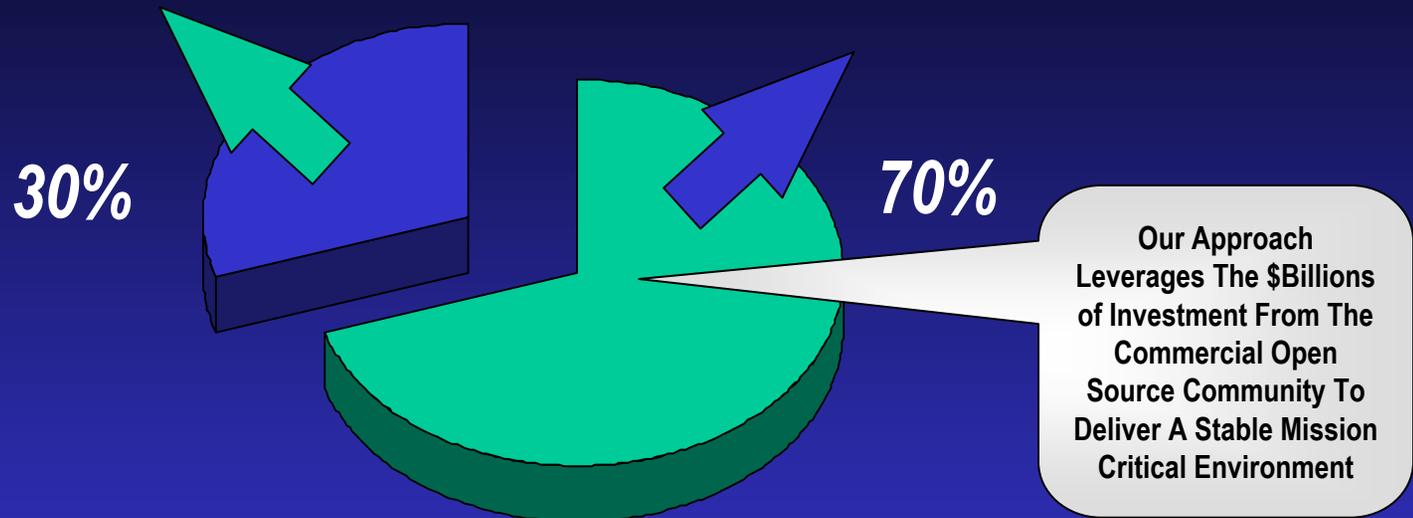
“OA in a Box” Components



Rationale For Infrastructure Focus

Applications

Infrastructure



The Government Currently Pays Multiple Vendors To Develop Infrastructure That Is Essentially the same across system environments

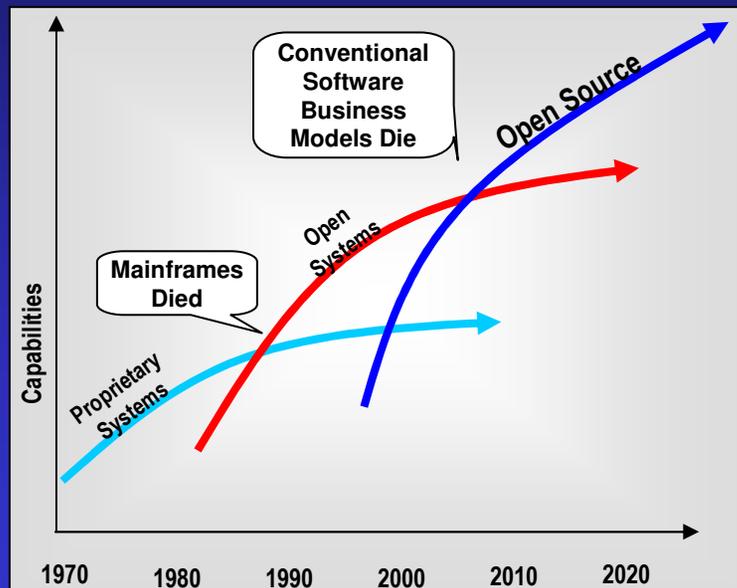
Benefits of Our COI Shared Source Solution

- Government Owned Software Infrastructure and Common Services Modeled After Industry's Use of "Open Source" But With Restrictions
- Minimal Or \$0 Cost Of Entry For All Capable Contractors and Government Agencies
- Interoperability Will "Ideally" Come at No Cost
- Helps To Organize The Building Blocks For Modernization Across All Domains
- Increases The ROI for Modernization Resources By Eliminating Duplicative Development and Licensing Costs
- Eliminates The Vendor Lock-In Conditions Of Many Combat System Components
- Reduces Test, Integration, Evaluation and Certification Costs
- Long Term Viability For Small Business and Software Jobs

Faster, Better, Cheaper Modernization!

Open Source Advantages

- Progeny Was Among The First (Maybe First) To Lobby Team Submarine For The Use of Open Source Software and Design Disclosure.....We Recognized Early That Vendor Lock-In Could Still Be Achieved With “Open Systems Architectures”
- We Have Demonstrated Innovations Derived From Combining Commodity Computing, Commodity Networking, and Open Source Software.....To Become A Disruptive Technology



Examples Of “Disruptive” Technologies

- Mainframe computers (desktops)
- Bookstores (Internet sales)
- Doctors (nurse-practitioners)
- Health insurance (HMOs)
- Network television (satellite & cable tv)
- Photography (digital imaging)
- Records (compact discs and MP3s)
- Telephone-long distance (Internet telephony)

Progeny’s Business Model Is Aligned With The “Open Source” Initiative.....I.e. Software “Services” Versus Proprietary Products

Development Tools/Resource

Component	Manufacturer-Nomenclature	Unit Cost (\$'s)	Open Source Alternatives	Unit Cost (\$'s)
Application Server	Borland - Enterprise Server AppServer	\$ 11,400 per CPU	JBoss	Free
Real-Time Operating System – Developers Licensing	LynxWorks - LynxOS Runtime	\$ 20,000	Linux with RT Extensions; depends on RT performance requirements	Free
CORBA Naming Services	PrismTech - OpenFusion Trading Services	\$ 1,200	Naming Services such as LDAP	Free
CORBA	ACE+TAO	Free	ACE+TAO	Free
CORBA – Java Tools	JacORB	Free	JacORB	Free
Data Distribution	RTI - NDDS/DDS	>\$50K	MTM-Based DDS implementation	Free
Run-Time Environment	Sun - Java Runtime Environment (J2RE & J2SE)	Free	Sun – Java Runtime Environment (J2RE & J2SE)	Free
Operating System	Sun – Solaris	Included with hardware	Linux	Free
Source Code Build Tools	Apache Ant	Free	Apache Ant	Free
Data Backup	Veritas - NetBackup Server	\$ 13,000	AMANDA, Arkeia, SyncBack	Free
Data Backup	Veritas - NetBackup Client	\$ 800	AMANDA, Arkeia, SyncBack	Free
Software Compiler	GNU - GCC	Free	GNU – GCC	Free
Software Build Configuration Tools	GNU – Make	Free	GNU – Make	Free
	Minimum Cost:	\$ 100, 500	Cost:	Free

Run-Time Environment

Component	Nomenclature	Unit Cost	Open Source Alternatives	Unit Cost (\$'s)
Application Server	Borland - Enterprise Server AppServer	\$ 11,400 per CPU	JBoss	Free
Database Server	Oracle Server Enterprise Edition	\$35,700	MySQL; PostgreSQL; Open Source Java/C/C++ Adapters	Free
Real-Time Operating System – Runtime Licensing	LynxWorks - LynxOS Runtime	\$ 700	Linux with RT Extensions; depends on RT performance requirements	Free
CORBA Naming Services	PrismTech - OpenFusion Trading Services	\$ 1,200	Naming Services such as LDAP	Free
CORBA	ACE+TAO	Free	ACE+TAO	Free
CORBA – Java Tools	JacORB	Free	JacORB	Free
Data Distribution	RTI - NDDS/DDS	\$ 100	MTM-Based DDS implementation	Free
Run-Time Environment	Sun - Java Runtime Environment (J2RE & J2SE)	Free	Sun – Java Runtime Environment (J2RE & J2SE)	Free
Operating System	Sun – Solaris	Included with hardware	Linux	Free
Data Backup	Veritas - NetBackup Server	\$ 13,000	AMANDA, Arkeia, SyncBack	Free
Data Backup	Veritas - NetBackup Client	\$ 800	AMANDA, Arkeia, SyncBack	Free
	Minimum Cost:	\$ 62, 900	Cost:	Free

Common Software Working Group

- Integrated Product Teams (IPTs) Review New Technology
- Set up by The Acoustic Rapid COTS Insertion (ARCI) Program
- Attended by Companies Contributing to the System Baseline
- Splinter Groups Research and Design Technology Insertion
- One Splinter Group Focuses on Software
 - Identifies New Open Source To Include in next TI Baseline
 - Coordinates Versions for Use
 - Addresses Common Software Needs
- Some Software Requirements Call for a Sharing of Source
 - Common Storage Server SW
 - Common Middleware
 - Common Error Recovery
- One Company May “Open Source” Components They Developed
- All Companies Could Share Source Code to Create a New Product
- All SW is “Community of Interest Shared Source”

Repository Structure

- SBIR Effort to Build and Explore Workings of an Open Source OA Repository
- Web Interface (www.opentoolkit.com)
- Using OpenCMS as the Web Page Content Management System
- OpenCMS Provides Complex Capabilities Without Requisite Knowledge of HTML
- Like the Open Toolkit, it's Open Source
 - www.opencms.org
- Navigation is by Products, Standards, Articles/News

Open Toolkit Home Page

The screenshot shows a web browser window displaying the Open Toolkit website. The address bar shows the URL <http://www.opentoolkit.org/Home/Projects/c4i.html>. The page features the Open Toolkit logo with the tagline "affordable and interoperable solutions". Navigation links include Home, Forums, Subscribe, and Support. A search bar is present with a "Go" button. A sidebar on the left lists categories: Home, Solutions, Standards, Packages, Projects, C4I, Tactical, and Initiatives. The main content area highlights the "Common Core C4I Architecture (CCCA)" with a globe graphic and a descriptive paragraph. Below this are sections for "SOLUTIONS", "STANDARDS", and "ARTICLES", each with a list of links. A right-hand sidebar contains sections for "Login", "OpenToolkit.org" (with a description), "TOP DOWNLOADS", "NEWS", and "MEMBERSHIPS" (listing OMG and W3C). The browser's taskbar at the bottom shows several open applications, including "Tactical - Opera" and "Microsoft Power...", along with the system clock showing 14:59.

Search OpenToolkit:

Products Go

Home
Solutions
Standards
Packages
Projects
C4I
Tactical
Initiatives

OPEN TOOLKIT
affordable and interoperable solutions

Home Forums Subscribe Support

Common Core C4I Architecture (CCCA)

The Common Core C4I Architecture (CCCA) is a collection of tools, services and applications that provide the communication interfaces and infrastructure for C4I information exchange applications. All of the solutions in the CCCA are either open or shared source and comply with open standards, hence providing an open architecture. Under the Solutions tab you will find a list of the CCCA tools, services and applications with links to descriptions, articles, news, related information and their associated downloads.

SOLUTIONS

Support & Maintenance Package Progeny Systems offers a Support & Maintenance Package for desired products, which not only enables you to receive technical support, but also provides you with tested, integrated, compatible product upgrades.

Development
Source Control - [CVS](#)
Application Programming Interface - [Java](#)
Compiler - [GCC](#)
Compiler - [Make](#)
Integrated Development Environment - [Eclipse](#)
Integrated Development Environment - [NetBeans](#)

Runtime
Database - [MySQL](#)
Operating System - [Linux](#)
Virtual Machine - [Java](#)
Semantic Web - [Jena](#)
Web Applications - [Cocoon](#), [Jakarta Struts](#)
Web Services - [Axis](#)

STANDARDS

ARTICLES

Login
You are logged in.
[Log out](#)

OpenToolkit.org
The OpenToolkit is a collection of Open Source Open Standard tools and services that can be used to make a Tactical or C4I application truly open and easy to develop and maintain. Browse through the pages and packages to see what is available.

TOP DOWNLOADS

NEWS

MEMBERSHIPS
[OMG](#)
[W3C](#)

ot: News for ne... Tactical

Inbox - Microsof... \\datastor(comp... License Manager System Architec... System Architect Tactical - Opera Microsoft Power... 14:59

Tools

- Infrastructure
 - Middleware (CORBA, ARCI MTM, DDS)
 - Databases (MySQL)
 - Runtime Environments (Java, Jakarta, Cocoon, Axis)
- Development Tools
 - GCC Compiler
 - Make
 - Integrated Development Environments (IDEs)
 - XML Tools
 - Interface Capture Tools

Access to Open Toolkit

- Access via Request on Website
- Requests are Fielded Through Progeny
- Applicants are Asked for Information
 - Navy Contract
 - POC
 - Application of Open Toolkit to Work
- Access Method to Track Use, not to Restrict
- Some Products May Have Export Restrictions
 - Website Refers Users to Package Owners

Retrieving Information

- Content Downloaded via HTML Link
- Some Packages Referred to Developer
 - SourceForge, Private Developers
- Others are Maintained on Site
 - Capture of Older Releases
 - Products Developed by Progeny or via Collaboration
- Intent is to Promote and Supplement
- Users can Suggest Additions to the Site
- Capability to Upload to Site in Works

Data Rights

- All Content is Open Source
 - Governed by GPL and Similar Open Source Licenses
- Some Content is “Open Source for Community of Interest”
 - Export Restrictions may Apply
- Future Capabilities of Site Can Include Project “Compartments”
- Intent is to Provide Capture of Validated Open Source Products
 - Those that Have Added Value to Combat System Development

Classification

- Opentoolkit is an Unclass Website
- Explicitly Provided for Internet Access
- Can be Mirrored on Other Classified Networks

Change Management

- Website is Backed by CVS
- CVS Portal Can Provide Mechanism for CM
- Other Groups, like IPTs, Drive CM Process
- Content on Website Mirrors Development Projects, Like ARCI
- Capture Latest Tools, Infrastructure
- Keep Older Versions While Still Used

Repository Metrics

- We Collect Metrics on:
 - Hits
 - Files
 - Pages
 - Visits
 - Sites
- Monthly Results are Available online
 - <http://opentoolkit.org/webstats/>

Toolkit Support

- Most Packages Have Support
- Toolkit Website Also Provides Documentation
- We Also Provide Forums for Users
- Contact Information is Provided on Website for Questions and Support

Additional Work

- Project Areas for Development
 - Packaged Solutions – for Web, Forms, Database, Signal Processing
 - Infrastructure Repository by Development Effort
- Structured, IPT-Connected Access Controls
- Upload/Review Features
- Add blogs to allow users to add value
- Add subscriptions so user can be notified when products/solutions are updated
- Add RSS feeds to product sites
- Possibly move to/ integrate with CollabNet site
- Elaborate product descriptions and examples
- Elaborate on initiatives – e.g. NCES
- Several security features
 - Disallow direct URL access to internal pages
 - Implement role-based access control to segregate user permissions
 - Use SSL to deliver sensitive pages – e.g. CCTA package and ARCI program