

ARIZONA JUDICIAL BRANCH

ENTERPRISE ARCHITECTURE STANDARDS

Purpose

The primary purpose of Information Technology (IT) is to enhance and support business and administrative requirements and processes within the courts. Enterprise Architecture (EA) provides a comprehensive framework of business principles, practices, and technical standards that direct the design, construction, deployment, and management of information technology for the courts. EA functions as a “building code” that facilitates the application of IT to business initiatives and objectives leading to change in an orderly, efficient, and cost-effective manner by describing a direction for current and future activities, supported by underlying principles, standards, and best practices.

Adopting an IT architecture, although intuitively a positive organizational direction, is often difficult. Standards are many times perceived as being set at the expense of freedom. However, today’s fast-paced technology demands and small funding amounts make architecture a strategic necessity. A mature IT enterprise must have the discipline to adopt and follow a consistent set of strategies, reference models, and exchange capabilities.

- Per Gartner, the strategic goal of enterprise architecture is to position the [entity] to leverage technology in support of the business strategy and make technology the proactive enabler of an agile, responsive enterprise that can react in real time to changes in the marketplace, and take advantage of new business opportunities.
- Enterprise architecture will provide standardization and elimination of redundancy and complexity across the Arizona Judicial Branch.
- The cross-jurisdictional nature of criminal justice activities supports adopting common architectures to facilitate integration.
- The Judicial Branch should avoid being what Gartner Group describes as a “typical unarchitected e-government” where “multiple sets of customer channels, interfaces and systems are independently developed ... and require duplicative infrastructure and forced disparate access experiences for constituents.”
- There is a lower cost to buy and support a limited set of products and standards; the judiciary can leverage both volume discount buying and maintain a less complex environment.
- Non-standard products and applications create a challenge to support and yield security concerns.

Scope

The table below contains the adopted Enterprise Architecture for the Arizona Judicial Branch. The standards, protocols and products listed are prescribed for core, leveraged (enterprise) activities and applications among the courts statewide. Where there are unique, local undertakings that cannot be leveraged, a court is free to go beyond the standards set here. When sharable modules related to core applications are developed, the standards must be followed.

The “Distributed Component (Bolt-on) Module” (available at <http://www.azcourts.gov/cot/EnterpriseArchitectureStandards.aspx>) documents the approaches to development of local, leveraged, and core standardized (enterprise) modules. To be sharable, supported in the statewide framework or part of core standardized (enterprise) applications, modules must be developed to the Enterprise Architecture Standards of the Arizona Judicial Branch.

Definitions/Implications

Definitions	Implications
Baseline – Listing of products and services typically in use today within the court system.	Provides context to aid reader in understanding the layer or scope being specified by the row in the table.
Retirement – Obsolete product or technology being targeted for de-installation.	No new use allowed without exception being granted by COT. Necessitates specific strategy in next IT Strategic Plan for removal/replacement within plan period.
Containment – Use of product or technology limited to maintenance and current commitments only.	No additional use allowed without exception being granted by COT, except enhancement or expansion of a current implementation. The next stop on the lifecycle is retirement; therefore, further investment is unwise and serves to make removal/replacement more difficult and expensive.
Mainstream – The current standard for any new systems or migrations from legacy systems.	The primary option when adopting a new technology or selecting a new product. Any other choice requires that an exception be granted by COT.
Scope of Standard – Elaborates on the degree or range of application of the mainstream item.	Distinctions may be made by function, court size, or jurisdiction, for example.
Watchlist – Emerging technologies products or releases being considered for adoption but not yet formally adopted.	Included for court reference, these items may be dropped or moved to mainstream in the next revision of the table as more becomes known about them. Courts should proceed cautiously in this area, using a pilot approach to implementation.
Comments – Any related information not fitting within the other columns.	
Exception – A formal agreement to enable the court to pursue a non-mainstream direction or install a non-standard product.	Requires use of the exception request document available at http://www.azcourts.gov/cot/EnterpriseArchitectureStandards.aspx and submittal to TAC for recommendation to COT for a formal motion. Exceptions are granted only to the court requesting the exception – further development or use outside that court requires a further exception.

Updates

A bi-annual review of these standards by the Technical Advisory Council is recommended. Local or state automation projects requiring exceptions can initiate a review of selected items at any time.

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Architecture Layers	Baseline (currently in use)	Retirement (targeted for de- investment)	Containment (limited to maintenance & current commitments)	Mainstream FUTURE (for new systems or legacy migration)	Scope of Standard	Watchlist: Emerging Technologies (to be evaluated for future inclusion)	Comments
Applications & Tools							
User Interface Delivery Method for Public Access	Browser-based: IE , Firefox , Chrome	Netscape , IE ≤6		Browser-based (Version Support) Responsive Web Design	For Microsoft Internet Explorer, Firefox, Google Chrome, Safari, Mobile Device Browsers	Edge	Websites should indicate browsers tested
User Interface Delivery Method for Business Applications	Browser-based, Windows forms: ASP , ASP.net	Character based	Silverlight	Browser-based (asp or asp.net), WPF , Windows forms, Angular		WinRT Windows Universal Apps , Native Mobile Apps, HTML5, Universal Apps	
Electronic Document Management	Hyland OnBase, LaserFiche , SIRE , FileNet , OpenText , OBOL	LaserFiche , Hyland OnBase ≤41-13 SP2	Hyland OnBase 12 14 SP3 2SP1	Hyland OnBase 13 15 SP2 SP1		Hyland OnBase 15 17 .X	
Document Imaging	Kofax; OnBase Scanning Module, PaperPort , FoxIt , ReadIris , ScandAllPro	Kofax Card (SCSI connection)	Kofax Ascent Capture	OnBase Production Document Imaging			See sep stds for non-OnBase scanning
Report Writer for Ad Hoc Reporting	Crystal Enterprise, Crystal 58 -11, SSRS	Crystal <10, MS SQL Server Reporting Services 2000 ≤2005	Crystal 10, MS SQL Server Reporting Services 200 8 5	Crystal >10, MS SQL Server Reporting Services 2008 2012 or 2014		MS SQL Server Reporting Services 2012 2016 SAP Enterprise 15	

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Report Writer for Business Application Reports	Varies: Crystal, native application report writers, “hard coded” reports, SSRS, <u>Report Builder</u>	Crystal <10, <u>MS SQL Server Reporting Services 2005</u>	Crystal 10; MS SQL Server Reporting Services 2005 <u>2008</u>	Crystal >10, MS SQL Server Reporting Services 2008 <u>2012 or 2014</u>		MS SQL Server Reporting Services 2012 <u>2016 SAP Reports 15</u>	
Data, Research, and Analysis Tools	SPSS SAS			SPSS, SAS, MS Analysis Services (SSAS)		<u>R</u>	
Development Languages	.ASP, <u>ASPX</u> , <u>classic ASP</u> , .NET Traditional 3GL , MUMPS , JAM, RPG, VB6, <u>C#</u> , <u>javascript</u> , <u>PERL</u> , <u>COBOL</u> , FoxPro <u>WebAPI</u>	<u>ASP (Classic)</u> , COBOL, JAM, RPG, MUMPS , FoxPro	Java (on a business case need basis), <u>ASP (Classic)</u> , .NET Framework <V2 <u>V3</u> .X, Silverlight	AJAX (streaming .asp), .NET Framework 3.X and 4.X, , Windows Workflow Foundation, VB.NET, ASP.NET, C#.NET, <u>F#.NET</u> (on a business case need basis)	XAML WPF WCF MVC/ <u>WebAPI</u>	<u>DotNet Core</u> , <u>AngularJS</u> , <u>Erlang</u> , <u>Swift</u>	
Development Environment	Visual Interdev , Visual Studio, PowerBuilder, Panther, MS- Access, <u>Creative Suite</u> , <u>Hawkeye</u> , <u>Eclipse</u> , <u>PHP</u> , <u>JAM</u> , <u>Nevron</u>	Panther , Visual Studio <2005 <u>2008</u> , Visual Studio 6, Visual Interdev	Visual Studio <2008 <u>2012</u> , <u>2010</u> , PowerBuilder, MS-Access, <u>Panther</u>	Visual Studio >2015 <u>2010 and</u> 2012		Visual Studio 2013 <u>Next Release</u> , <u>Xamarin</u>	

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Source Control	PVCS , Visual Source Safe, CCC Harvest (Phx.), Aldon (JOLTS), SCCS (DW) , Team Foundation Server, <u>eGIT</u> , <u>SVN</u> , <u>Subversion</u>	Aldon		Must use source control	All developed systems	<u>Git</u>	Will consider a process to meet these requirements, and not a specified tool.
Analysis Tools	HOW , <u>Git</u> Visio, BPEL , Erwin, BPWin, Rational	HOW		UML, BPEL BPMN			
Code Generation	PowerBuilder, Visible Developer, Alachisoft TierDeveloper	<u>Alachisoft</u>	<u>Visible Developer</u>	<u>T4 (with Visual Studio)</u>		<u>Razor</u> , <u>Roslyn</u>	
Office/Personal Productivity Tools							
Word Processing	Word Perfect , Word	Word Perfect , Word 2003 <u>2007</u> <u>7</u>	Word <u>2007</u> <u>2010</u>	Office 365, Word 2013 Word <u>2010</u> <u>2016</u>			
Spreadsheet	Quattro Pro , Excel	Excel 2003 <u>2007</u> , Quattro Pro	Excel <u>2007</u> <u>2010</u>	Office 365, Excel 2013 Excel <u>2010</u> <u>2016</u>			
Presentation	CorelDraw , PowerPoint	PowerPoint 2003 <u>2007</u> , CorelDraw	PowerPoint <u>2007</u> <u>2010</u>	Office 365, PowerPoint 2013 PowerPoint <u>2010</u> <u>2016</u>			
Local Standalone Database,	MS-Access, <u>TurboImage</u> , <u>T- SQL</u> , <u>PostgreSQL</u>	MS-Access 2003 <u>2007</u>	MS-Access <u>2007</u> <u>2010</u>	Office 365, MS-Access 2013 MS-Access <u>2010</u> <u>2016</u>	Non-Production use only		

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E-mail Client Product	Outlook, GroupWise, Lotus IBM Notes	Outlook ≤20032007, Lotus IBM Notes, GroupWise (unsupported versions)	Outlook 20072010, Lotus IBM Notes, GroupWise (supported versions)	Office 365, Outlook 2013 Outlook 20102016			
Instant Messaging	Yahoo Messenger, MS- Lync, MessengerSkype for Business, AIM, Trillian, Cisco Presence, IBM Sametime		MS-Live Communication Server, <u>Lync</u>	Lync Skype for Business 2013 <u>Skype for Business</u> 2016	Jabber (@AOC)		
Collaboration	<u>SharePoint,</u> Exchange + Outlook, MS- Office, Office <u>Live365,</u> WebexWebEx, Google Apps, <u>GoToMeeting,</u> <u>SMART</u> <u>Notebook,</u> <u>Dynamics</u>			SharePoint Services, SharePoint Server >2007, Live Communication Server, WebEx, Google Apps, GoToMeeting, <u>MS-</u> <u>Dynamics CRM</u>		<u>Skype for Business</u>	
<u>Remote Interpreting,</u> <u>ad hoc</u>				<u>Stratus / Language</u> <u>Line</u>			
Social Media Tools				Per Local Court Business Policy			

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Desktop Virtualization	VMWare, Citrix			VMware View, Citrix Xen	Thin Client Installation		
Distance Learning	Centra, Granicus, TraCor Accord LMS		Centra	Centra , Granicus, Accord LMS		TraCor LMS	
Data Architecture							
DBMS	Informix, DB2/UDB , SQL Server, MySQL, Clipper , FoxPro Oracle , Progress , B-trieve	SQL Server ≤2005; FoxPro , Clipper	SQL Server 2008	SQL Server 2012- 2014 , MSDE/SQLServer Express, MySQL	Court core business applications (on a business case need basis)	SQL Server 2016 , MongoDB , Redis , Azure Document Database , Azure SQL	Black box DBMS not incl. Azure on the Government Cloud Only , NOSQL should be encapsulated in a Microservice Architecture
Data Warehouse DBMS	Informix XPS, SQL Server		Informix XPS, SQL Server 2008	SQL Server 2012		SQL Server 2016	
DBMS Modeling Tools	PowerDesigner, Erwin, Visio			Power Designer, ER Studio, Erwin, Visio	UML 2.0 compliant		Tools must be capable of creating alter scripts to update database schemas.

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Data Exchange Model	JXDD 3.0.0.1, Fixed format, XML homegrown, Electronic Court Filing (ECF)		Fixed format, XML homegrown	GJXDM V3.0.3, NIEM, ECF 4.X	Between autonomous systems	<u>JSON+REST,</u> <u>Microservices</u>	In conjunction with the Arizona Criminal Justice Commission's Arizona Data Dictionary. XML standard at http://it.ojp.gov/ jxdd
Scanning Format	Tagged Image File Format (TIF), Portable Document Format (PDF)			Tagged Image File Format (TIF), Portable Document Format (PDF)		Searchable PDF	
Audio File Format	Proprietary formats, .WAV			Uncompressed .WAV format	For interchange with other courts and archive		Industry- standard output must be playable by non-proprietary readers.
Video File Format/ Protocol	Proprietary formats, AVI			SIP, H.323 H.264 (720p HD, 15 fps) AVI, NTSC	Transmission over AJIN <u>only</u> Storage		Max 384 kbps/ concurrent session –
Email Protocol	SMTP, MIME			SMTP and MIME			

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Data Transmission Encryption	Triple Data Encryption Standard (Triple DES)			Triple Data Encryption Standard (Triple DES), DPS FIPS 140	Per ACJA 1-503, the encryption key shall be maintained by AJIN mgt for all public records	AES (advanced encryption standard)	For data encryption over public networks
Stored Data Encryption				Back up data on mobile devices to court servers before encrypting	Per ACJA 1-503, the encryption key shall be maintained by AJIN mgt for all public records	BitLocker	Subject to pilot test results
E-mail Encryption	Secure Mail Gateway, S/MIME, Office 365			S/MIME Sophos (Server)	Transport only Storage		Req's usage procedure
Networks and Platforms							
Network Protocol	Transmission Control Protocol/ /Internet Protocol (TCP/IP), SNA	SNA		TCP/IP, IPsec 4 (IPv4)		IPsec 4 (IPv6)	
Wireless Network Access	WEP, WTLS, PEAPWPA, WPA2, Web-Auth	WEP		PEAP, WPA2			
Network Operating System	MS-Windows, Novell NetWare	Novell (unsupported) Windows (unsupported)	MS-Windows Server 2003	MS-Windows Server 2008 R2, 2012 R2	For gaining access to any enterprise system	Windows Server next release	

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Client Operating System	Windows 2000, XP, Vista, and-7, <u>8.1, 10</u>	≤ Windows XP <u>Vista</u>	Windows 7, Vista	Microsoft Windows 8.1, <u>Windows 10</u>	Current supported version only – previous versions are contained or retired		AOC apps not certified to run on Windows 7
Client Device Antivirus Software	McAfee, Sophos, Symantec, Trend, AVG, Kaspersky			McAfee, Sophos			
Server Operating Systems	Microsoft Windows, UNIX, OS/400, DEC VMS, VMS-AIX, Solaris, Linux	OS/400, DEC VMS, Microsoft Windows ≤20032008	Microsoft Windows Server2003 <u>Server2008 R2</u>	Microsoft Windows Server 2012 <u>R2</u> , 2008 R2 , UNIX, Linux	Enterprise applications	Windows Server next version <u>2016</u>	
<u>Patch Management</u>	<u>WSUS, LANDESK</u>			<u>WSUS, LANDESK</u>			
<u>Vulnerability Scanning Tool</u>	<u>Tenable Nessus, ip360 (nCircle)</u>			<u>Nessus Manager</u>			
Server Antivirus Software	McAfee, KasperskyTrend, Sophos, <u>Symantec</u>			McAfee, Kaspersky, Sophos, <u>Symantec, Trend</u>			
Server Virtualization				VMware Vcenter ESX <u>HyperV</u>	<u>Only for ≤2012 R2</u>	Docker <u>(Application Virtualization)</u>	
Mobile Operating Systems	BlackBerry O/S, Apple IOS, Android, Windows	BlackBerry O/S		Windows	AOC-provided devices for access to statewide apps		
Software as a Service							
Office Productivity	<u>Office 365</u>			Office 365			
Shared Services							

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Component Service Layer	DCOM, ASP, SOAP, MS-Windows Communication Foundation (WCF)		Web -Services (previous version), DCOM, ASP (classic)	Web -Services (current version), SOAP / REST Objects, Remoting, MS-Windows Communication Foundation (WCF)		Web -Services (next version)	
Directory Services	Active Directory, Novell eDirectory (NDS) , LDAP			Active Directory, ADFS , LDAP, AD-LDS	Within Branch Outside Branch		
Electronic Signatures	/s/ with internal two-factor authentication; signature pad; biometrics			MS Office Digital Signature, Adobe Digital ID	Self certification within court network	PKI, signature pad, biometrics, eSeal	Requires court policy changes accompanying e-filing.
Login Authentication	UserID/Password, Biometrics			UserID/Password, Biometrics		Smart Devices, Single Signon via ADFS	
Remote Access through Internet (by employees or trusted partners)	VPN with IPSec, VPN with proprietary encryption, 3DES			VPN with IPSec, 3DES			
Message Transport Middleware							
Message Transport	MQ	MQ ≤V5.2	MQ V5.3/V6.0	MQ V7.0, MQ SSL		NServiceBus over MQ	
Data Transformation ETL	MQSI, Data Junction, Cloverleaf, BizTalk, Scribe	Data Junction, MQSI ≤V2.1 , DTS	Cloverleaf, WMB V6V7 .0, BizTalk	WMB V78 .0, SSIS Scribe	At the state level; not required at the local level. (Dynamics/Agave)	EventStore	

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Data Routing/Publish and Subscribe	MQSI; Cloverleaf, BizTalk	MQSI ≤V2.4	Cloverleaf, WMB V6V7.0 , BizTalk	WMB V7V8.0	At the state level; not required at the local level.	EventStore, NServiceBus	
File Transfer, Scheduled Production	FTP, SFTP , HTTP, MQ	FTP (intercourt and using public Internet), MQ ≤5.26.0	FTP (intracourt only), MQ V5.3/ V6V7.0	MQ V7. 05 , Web Services	Scheduled production transfers of data		Overall direction is toward MQ exclusively
File Transfer, Ad Hoc	FTP, SFTP , HTTP, MQ	MQ ≤56.20	MQ V5.3/V6V7.0	MQ V7. 05 , FTP	One-time, unscheduled bulk transfers of data only		Transfer of sensitive data requires secure FTP
Jury Business Applications							
Jury Management	Jury+, Jury for Windows			Jury+ (see ACJA 1- 501)			

Exceptions

Exception Process Evaluation Principles (detailed in *Enterprise Architecture Standards Exception Request Document* at http://www.azcourts.gov/cot/EnterpriseArchitectureStandards.aspx/EAS_Exception.doc):

1. City/County investment has already been made (apart from the court) that reduces the cost to the court.
2. Overall cost (total cost of ownership) is reduced from that of implementing the statewide standard. This savings must be balanced against the potential impacts to the broader Branch initiatives. Specific areas to be considered are: financial leverage, integration, support, and training.
3. Overall risk is reduced from that of implementing the statewide standard.
4. The local IT function is/will be providing support.
5. The technology demonstrates long-term viability. This must include the consideration of the vendor's viability and future costs to evolve the technology solution.
6. Substantially greater productivity is enabled through adoption of a local standard.

In addition, the court requesting an exception agrees to bear any later costs at the local level necessary to integrate the exception component or system with a statewide standard component or core system.

Arizona Code of Judicial Administration 1-505 adopts this document. It references this document, as maintained and published on the Commission on Technology Web site, as the Arizona Judicial Branch Enterprise Architecture Standards.