

# Mainframe Upgrade Project

ITAC Meeting  
August 27, 2014

 **ADOA-ASET**  
Arizona Strategic Enterprise Technology

# Mainframe Upgrade Project

## Presenters:

- Donald Hennington – COO & Assistant Director, ADOA-ASET
- Patrick Cravens – Manager, Mainframe Systems Administration, ADOA

# Business Problem

- Customer utilization of mainframe processing has reached the capacity limits of the current z/10 mainframe system
- Application migration from the current mainframe platform to other platforms such as Windows or Linux cannot be accommodated with the current z/10 system
- Federal requirements do not allow for capital purchase of new hardware
- Provisioning of Business Recovery solution for Department of Economic Security (DES)

# Strategic Alignment

Winning Priority	Goals/Objectives	Relationship to Project
<b>1.3 – Invest in Core Enterprise Capabilities</b>	Take the necessary investment approach to instantiate a new ADOA mainframe within the next fiscal year.	This effort supports a business decision that will enable ADOA-ASET to provide more flexible computing capabilities for agency customers as their critical applications migrate from CICS/MVS to other more modern operating systems.
<b>1.4 – Proactively Manage Enterprise Risk</b>	Ensure continuity of mainframe services to the agency clients.	Eliminate capacity constraints limiting current service delivery
<b>3.1 – Improve Quality, Capacity and Velocity of Business Services</b>	Provide state of the art technologies enhancing the delivery of flexible business services.	By utilizing a state of the art mainframe solution, the investment in this infrastructure enables flexible application transition from one operating system to another, there by shortening the application development delivery cycle.

May 12, 2014 – 10:00 A.M.

## Heat MAP May 2014 - Prime

Day of week	DATE	TIME	z10 Total	SYSPLEX												Pima PIM1
				MIPS	Hawaii	AHCCCS	ADOA ASET	ADOA AFIS	ADOT SYSA	ADOT SYSB	ADOT SYSC	ADOT SYSD	ADC XLO5	ADOR	ASU	
				110	641	105	93	210	40	43	40	105	35	87		
Monday	14/05/12	8.00	86.1%		30.9%	94.6%	89.2%	34.6%	105.3%	48.7%	71.2%	52.8%	153.8%	69.1%	46.1%	31.1%
Monday	14/05/12	9.00	96.0%		36.8%	102.2%	83.1%	34.6%	135.3%	48.7%	78.7%	48.7%	186.1%	78.3%	35.0%	34.6%
Monday	14/05/12	10.00	94.2%		29.4%	99.6%	78.4%	38.1%	139.9%	48.7%	78.7%	48.7%	184.6%	69.1%	33.2%	34.6%
Monday	14/05/12	11.00	95.6%		42.7%	105.7%	63.1%	32.9%	124.5%	44.7%	71.2%	48.7%	210.7%	69.1%	40.6%	34.6%
Monday	14/05/12	12.00	91.6%		47.1%	100.2%	49.2%	31.1%	127.6%	44.7%	82.5%	48.7%	183.0%	64.5%	42.4%	38.1%
Monday	14/05/12	13.00	91.0%		45.6%	103.4%	32.3%	36.3%	125.3%	48.7%	71.2%	56.8%	181.5%	82.9%	31.4%	34.6%
Monday	14/05/12	14.00	97.0%		75.1%	107.2%	46.1%	34.6%	139.9%	48.7%	86.2%	52.8%	170.7%	78.3%	46.1%	34.6%
Monday	14/05/12	15.00	97.9%		48.6%	103.7%	89.2%	34.6%	146.1%	56.8%	86.2%	52.8%	190.7%	59.9%	35.0%	34.6%
Monday	14/05/12	16.00	93.6%		42.7%	98.4%	123.1%	32.9%	119.9%	48.7%	63.7%	48.7%	195.3%	59.9%	42.4%	34.6%
Monday	14/05/12	17.00	73.3%		33.9%	86.8%	78.4%	25.9%	55.3%	44.7%	52.5%	52.8%	173.8%	55.3%	24.0%	27.7%
Tuesday	14/05/13	8.00	87.0%		32.4%	95.4%	89.2%	39.8%	111.5%	44.7%	75.0%	52.8%	143.0%	64.5%	49.8%	34.6%
Tuesday	14/05/13	9.00	93.8%		28.0%	102.4%	86.1%	36.3%	129.9%	48.7%	93.7%	48.7%	160.0%	69.1%	40.6%	34.6%
Tuesday	14/05/13	10.00	92.7%		30.9%	98.6%	69.2%	32.9%	136.1%	48.7%	112.5%	48.7%	172.3%	64.5%	42.4%	34.6%
Tuesday	14/05/13	11.00	96.8%		55.9%	104.2%	64.6%	51.9%	126.8%	48.7%	97.5%	48.7%	178.4%	64.5%	46.1%	38.1%
Tuesday	14/05/13	12.00	95.4%		66.2%	103.2%	50.8%	34.6%	130.7%	48.7%	71.2%	52.8%	186.1%	73.7%	51.6%	41.5%
Tuesday	14/05/13	13.00	93.7%		50.1%	101.2%	29.2%	32.9%	130.7%	52.8%	123.7%	52.8%	206.1%	64.5%	33.2%	38.1%
Tuesday	14/05/13	14.00	91.7%		47.1%	100.9%	30.8%	32.9%	136.8%	48.7%	82.5%	52.8%	183.0%	69.1%	35.0%	34.6%
Tuesday	14/05/13	15.00	91.9%		50.1%	101.2%	30.8%	34.6%	132.2%	48.7%	90.0%	52.8%	181.5%	92.1%	44.3%	34.6%
Tuesday	14/05/13	16.00	87.9%		35.3%	98.4%	83.1%	32.9%	113.0%	48.7%	82.5%	52.8%	160.0%	59.9%	40.6%	34.6%
Tuesday	14/05/13	17.00	73.5%		32.4%	95.4%	60.0%	32.9%	46.9%	40.6%	56.2%	56.8%	141.5%	55.3%	35.0%	31.1%
Wednesday	14/05/14	8.00	87.1%		33.9%	93.4%	89.2%	34.6%	109.9%	48.7%	82.5%	52.8%	150.7%	92.1%	51.6%	34.6%
Wednesday	14/05/14	9.00	91.7%		32.4%	97.9%	87.7%	45.0%	126.8%	48.7%	82.5%	52.8%	163.0%	82.9%	42.4%	38.1%
Wednesday	14/05/14	10.00	96.3%		30.9%	106.2%	66.1%	39.8%	136.1%	48.7%	82.5%	52.8%	173.8%	119.7%	38.7%	38.1%
Wednesday	14/05/14	11.00	91.8%		53.0%	99.4%	70.8%	36.3%	125.3%	48.7%	67.5%	52.8%	147.7%	78.3%	64.6%	38.1%
Wednesday	14/05/14	12.00	92.9%		63.3%	93.6%	56.9%	32.9%	132.2%	48.7%	105.0%	52.8%	169.2%	78.3%	73.8%	38.1%
Wednesday	14/05/14	13.00	87.0%		44.2%	99.9%	29.2%	31.1%	124.5%	44.7%	67.5%	48.7%	155.4%	73.7%	42.4%	31.1%
Wednesday	14/05/14	14.00	86.5%		38.3%	98.6%	32.3%	31.1%	133.8%	48.7%	71.2%	48.7%	140.0%	64.5%	44.3%	34.6%
Wednesday	14/05/14	15.00	85.1%		44.2%	99.6%	32.3%	36.3%	127.6%	48.7%	67.5%	52.8%	124.6%	64.5%	42.4%	31.1%
Wednesday	14/05/14	16.00	88.8%		36.8%	103.7%	116.9%	36.3%	113.0%	48.7%	67.5%	52.8%	101.5%	64.5%	49.8%	34.6%
Wednesday	14/05/14	17.00	67.3%		36.8%	88.1%	40.0%	29.4%	49.2%	40.6%	48.7%	56.8%	115.4%	55.3%	25.8%	27.7%

# August 1, 2014 – 10:00 A.M.

## Heat Map August 2014 All Shifts

Day of week	DATE	TIME	z10 Total	MIPS	SYSPLEX												ASU	Pima PIM1
					Hawaii	AHCCCS	ADOA ASET	ADOA AFIS	ADOT SYSA	ADOT SYSB	ADOT SYSC	ADOT SYSD	ADC XLO5	ADOR	ASU	Pima PIM1		
Friday	14/08/01	0.00	54.2%	1919	130	763	125	111	250	47	51	47	125	42	104	55		
				19.1%	41.0%	58.5%	181.7%	60.7%	32.5%	41.2%	77.2%	44.6%	41.5%	20.3%	58.8%			
Friday	14/08/01	1.00	48.0%	17.7%	54.6%	58.5%	69.2%	52.3%	28.5%	37.5%	36.6%	30.8%	36.9%	14.8%	20.8%			
Friday	14/08/01	2.00	40.3%	14.7%	44.0%	29.2%	38.1%	23.1%	28.5%	33.7%	81.3%	69.2%	59.9%	14.8%	31.1%			
Friday	14/08/01	3.00	52.6%	22.1%	40.5%	46.2%	22.5%	76.9%	28.5%	41.2%	85.4%	144.6%	69.1%	16.6%	41.5%			
Friday	14/08/01	4.00	63.8%	67.7%	47.1%	104.6%	22.5%	63.8%	44.7%	41.2%	52.8%	200.0%	82.9%	24.0%	20.8%			
Friday	14/08/01	5.00	63.7%	79.5%	43.5%	195.4%	27.7%	51.5%	32.5%	41.2%	44.7%	121.5%	110.6%	25.8%	31.1%			
Friday	14/08/01	6.00	59.1%	54.5%	37.5%	212.3%	31.1%	32.3%	32.5%	41.2%	61.0%	149.2%	59.9%	25.8%	31.1%			
Friday	14/08/01	7.00	64.8%	95.7%	48.1%	144.6%	34.6%	39.2%	32.5%	93.6%	44.7%	160.0%	55.3%	24.0%	34.6%			
Friday	14/08/01	8.00	82.9%	109.0%	66.4%	144.6%	36.3%	119.1%	36.6%	78.7%	44.7%	133.8%	59.9%	38.7%	31.1%			
Friday	14/08/01	9.00	83.3%	104.6%	70.0%	90.8%	32.9%	137.6%	40.7%	56.2%	44.7%	149.2%	59.9%	38.7%	34.6%			
Friday	14/08/01	10.00	87.5%	125.2%	66.2%	109.2%	43.3%	128.4%	97.6%	56.2%	40.7%	180.0%	59.9%	40.6%	31.1%			
Friday	14/08/01	11.00	81.0%	113.4%	65.9%	73.8%	26.0%	122.2%	77.2%	52.4%	40.7%	192.3%	55.3%	25.8%	27.7%			
Friday	14/08/01	12.00	77.7%	110.5%	58.6%	78.5%	29.4%	107.6%	93.5%	56.2%	40.7%	193.8%	50.7%	36.9%	31.1%			
Friday	14/08/01	13.00	81.0%	138.4%	54.9%	87.7%	27.7%	111.5%	69.1%	127.3%	36.6%	210.8%	55.3%	27.7%	27.7%			
Friday	14/08/01	14.00	84.2%	144.3%	61.9%	92.3%	36.3%	119.1%	40.7%	63.7%	40.7%	210.8%	55.3%	33.2%	27.7%			
Friday	14/08/01	15.00	81.9%	134.0%	61.9%	90.8%	29.4%	117.6%	44.7%	59.9%	40.7%	196.9%	50.7%	38.7%	27.7%			
Friday	14/08/01	16.00	75.0%	123.7%	46.8%	129.2%	27.7%	106.1%	40.7%	48.7%	40.7%	206.2%	50.7%	24.0%	27.7%			
Friday	14/08/01	17.00	60.4%	120.8%	45.3%	64.6%	22.5%	69.9%	32.5%	41.2%	44.7%	144.6%	46.1%	20.3%	24.2%			
Friday	14/08/01	18.00	61.6%	122.2%	42.0%	64.6%	22.5%	41.5%	32.5%	63.7%	36.6%	176.9%	170.5%	38.7%	24.2%			
Friday	14/08/01	19.00	57.7%	83.9%	45.0%	61.5%	26.0%	79.9%	40.7%	44.9%	142.3%	64.6%	115.2%	18.5%	24.2%			
Friday	14/08/01	20.00	62.4%	107.5%	50.3%	64.6%	74.4%	67.6%	36.6%	44.9%	142.3%	64.6%	46.1%	18.5%	62.3%			
Friday	14/08/01	21.00	64.8%	58.9%	52.3%	69.2%	176.5%	34.6%	36.6%	44.9%	182.9%	53.8%	50.7%	86.7%	24.2%			
Friday	14/08/01	22.00	56.8%	73.6%	35.0%	56.9%	193.8%	46.1%	32.5%	37.5%	113.8%	38.5%	41.5%	79.3%	24.2%			
Friday	14/08/01	23.00	50.2%	64.8%	36.7%	47.7%	166.1%	32.3%	32.5%	37.5%	97.6%	24.6%	41.5%	55.4%	27.7%			
Saturday	14/08/02	0.00	55.1%	17.7%	46.3%	49.2%	160.9%	55.3%	32.5%	41.2%	187.0%	26.2%	41.5%	20.3%	55.4%			
Saturday	14/08/02	1.00	34.3%	16.2%	26.4%	23.1%	84.8%	43.0%	28.5%	37.5%	73.2%	26.2%	41.5%	12.9%	17.3%			
Saturday	14/08/02	2.00	35.1%	14.7%	21.1%	32.3%	124.6%	27.7%	28.5%	41.2%	69.1%	43.1%	59.9%	14.8%	31.1%			
Saturday	14/08/02	3.00	49.4%	23.6%	20.6%	173.8%	58.8%	42.3%	28.5%	44.9%	73.2%	104.6%	69.1%	14.8%	41.5%			
Saturday	14/08/02	4.00	49.1%	50.1%	42.5%	149.2%	19.0%	24.6%	40.7%	71.2%	40.7%	66.2%	41.5%	24.0%	20.8%			
Saturday	14/08/02	5.00	47.0%	83.9%	28.9%	187.7%	17.3%	11.5%	28.5%	37.5%	32.5%	78.5%	69.1%	22.1%	27.7%			
Saturday	14/08/02	6.00	42.3%	111.9%	22.6%	156.9%	17.3%	13.1%	28.5%	33.7%	52.8%	53.8%	41.5%	22.1%	20.8%			
Saturday	14/08/02	7.00	36.8%	141.4%	16.4%	61.5%	15.6%	43.8%	28.5%	33.7%	28.5%	23.1%	36.9%	18.5%	27.7%			

# Project Risks

- Funding unavailable for continuation of lease
  - Repossession of physical hardware and software
  - Agencies unable to perform business
  - Loss of revenue
- Additional capacity insufficient to resolve agencies' processing requirements
- Agencies significantly reduce or expand processing demand from mainframe

# Proposed Solution

- Lease a more robust IBM Mainframe via Fair Market Value Lease procurement mechanism to provide relief to currently constrained customers – CAPEX - OPEX
- Leasing vehicle to allow for improved flexibility in long term capacity needs, Operating System diversity, enabling LINUX and Windows capabilities in same hardware platform
- This solution to provide sufficient capacity for approximately five (5) years *(Based on historical processing demand since 2010)*
- Provides sufficient capability to deliver Business Continuity for DES

# zEC12 – 412 Five Year Costing Projection

Description	Category	Development or Operational	Units	Unit Cost	Total Cost
Lease of IBM zEC12 Mainframe System, including hardware maintenance spread over initial seven (7) months	Hardware	Development	7 months	\$107,578.00	\$753,047.00
Software Upgrade costs for new mainframe processor (one time charge)	Software	Development	1st year	\$1,166,550.00	\$1,166,550.00
Software license costs for new mainframe processor initial year	License & Maint Fees	Development	1st year	\$958,774.00	\$958,774.00
<b>Development Sub Total</b>					<b>\$2,878,371.00</b>
Lease of IBM zEC12 Mainframe System, including hardware maintenance spread over 48 months	Hardware	Operational	48 months	\$107,578.00	\$5,163,751.00
Mainframe operational costs for four (4) years. Year 2 is substantially higher due to increased capacity. Years 3-5 assume 5% growth.	Software	Operational	4 years	\$11,060,203.07	\$44,240,815.00
<b>Operational Sub-Total</b>					<b>\$49,404,566.00</b>
<b>Project Total</b>					<b>\$52,282,937.00</b>

# Questions ?

Thank You

# Current System – z10 - 411

- Capacity

- MIPS - 1917
- Measured Service Units (MSU) - 237
- Active Processors – 11
- 17 Logical Partitions (LPARs)
- 8 Agency Core Customers
- Top 5 Agencies account for 84% of usage

- Utilization

- Average utilization of current total capacity regularly 72%, with bursts to 90%

- Installed

- October 2010
- Removed from Marketing and the Ability to Upgrade – June 2012
- One time upgrade of processors expiring October 1, 2014



# Upgraded System – zEC12 - 412

- Capacity

- MIPS - 2389
- Measured Service Units (MSU) - 299
- Active Processors – 12
- 17 Logical Partitions (LPARs)
- 8 Agency Core Customers
- Top 5 Agency's account for 84% of usage

- Utilization

- Average utilization of total capacity anticipated to be 82%

- Implementation

- November 2014 (Install)
- Removed from Marketing and the Ability to Upgrade – June 2016

