

Headquarters U. S. Air Force

Integrity - Service - Excellence

Software Technology Conference Service Session



***John Gilligan
Chief Information Officer
29-30 April 2002***

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Overview

- Where We're Going/GSTF
- What We Need
- Implications





SECAF's & CSAF's Expectations

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Air Force made strategic commitment that information will transform operational effectiveness



Secretary James G. Roche



General John P. Jumper

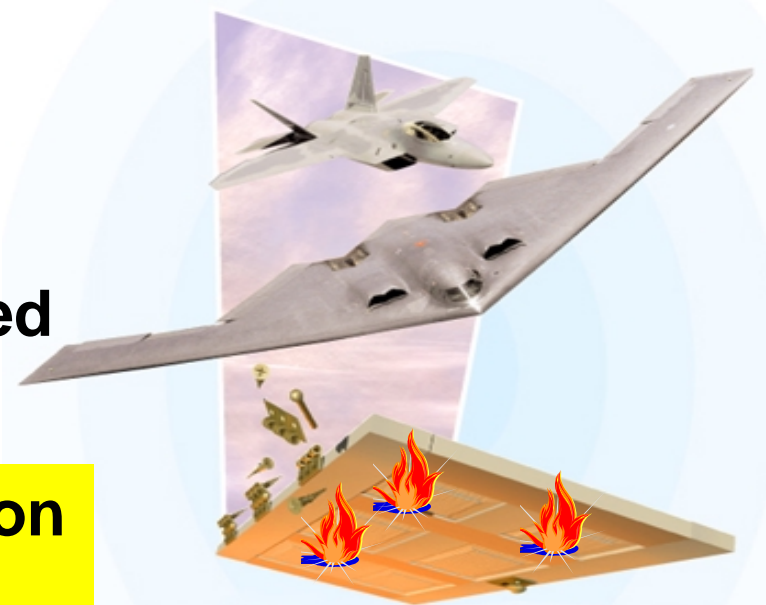
We must fundamentally transform our Combat and Support capabilities by leveraging information and process improvements across the Air Force enterprise to achieve significant operational efficiencies and drive down support costs.

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“IT” Capabilities Required for Global Strike Task Force (GSTF)

- **Interconnected locations, platforms, and joint/coalition participants**
- **“Conversations at the machine level”- reduce cycle times**
- **Reachback/reduced forward footprint**
- **Real-time simulation capability**
- **Horizontal integrated ISR**
- **Enroute tasking and retasking**
- **Seamless sharing of fused, trusted information...to the shooter**



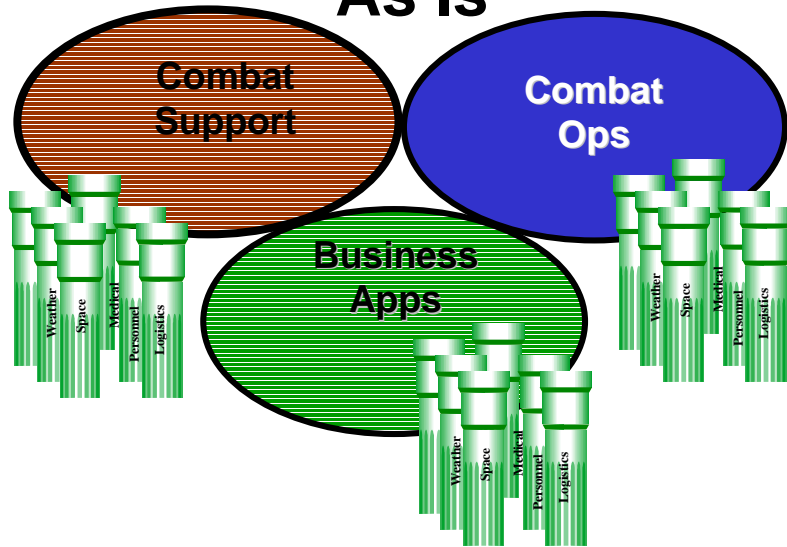
**Need Global Enterprise Information
Capability...to achieve GSTF**



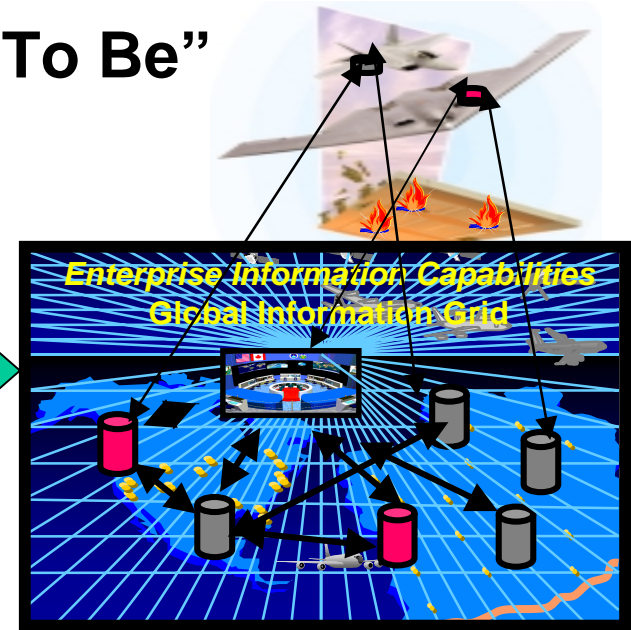
Vision: Where We Are Going

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“As Is”



“To Be”



Enabled mission capabilities through seamlessly integrated access to the right information anytime, anywhere

“...if we have the courage to think across stove pipes, if we have the tenacity to think about the effect...we can make this happen.” Gen Jumper

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IT Helping to Transforming the Air Force

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■ **Cooperative UAVs**

- **Convert raw information from different platforms into targeting data for operators & commander awareness**
- **Afghanistan: Global Hawk & Predator UAVs, RC-135 & U-2, E-8Cs, Navy E-2s and P-3s, and space assets linked to resolve targeting location and identification**

IT Enables This





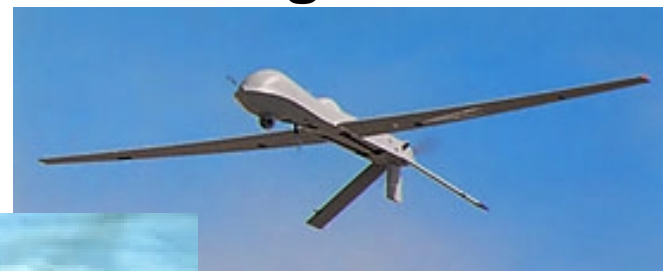
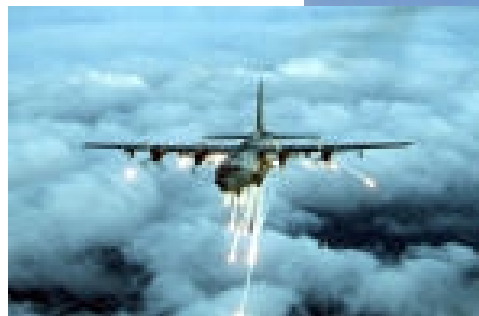
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Another Innovative Use of IT

C-130 Gunships - Predator (Afghanistan)

- Predator found and illuminated target
- Worked so well that the gunships asked if they could have the data from the Predator go directly to them
- Within six days, we were able to provide a quick-reaction system on board the gunship that allowed it to see the same thing the Predator was seeing

IT Enabled



“They’re down there with this high-tech stuff, riding a horse, with SATCOM giving target coordinates to a bomber,” the officer continued. “Talk about the extremes of war.”



“No single piece of this equation is transformational; rather, it is the integration of all our capabilities--both old and new--that elevates our operational effectiveness to new heights.”

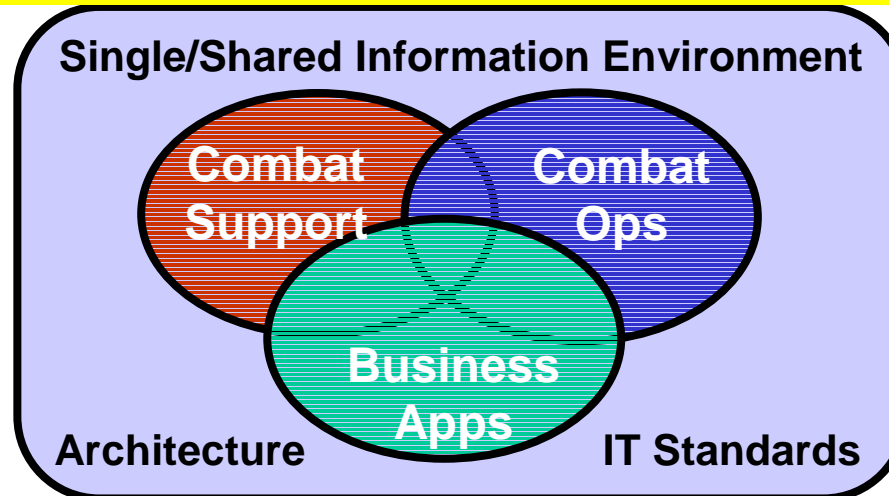
-- Gen Jumper



Vision: Where We Are Going

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Vision: Enabled mission capabilities through seamlessly integrated access to the right information anytime, anywhere



Common Technology Foundation

- Common security & authentication
- WEB-enabled data access
- Publish & subscribe messaging techniques
- XML tool sets expediting data availability across the WEB
- Leverage COTS and apply to the AF Enterprise

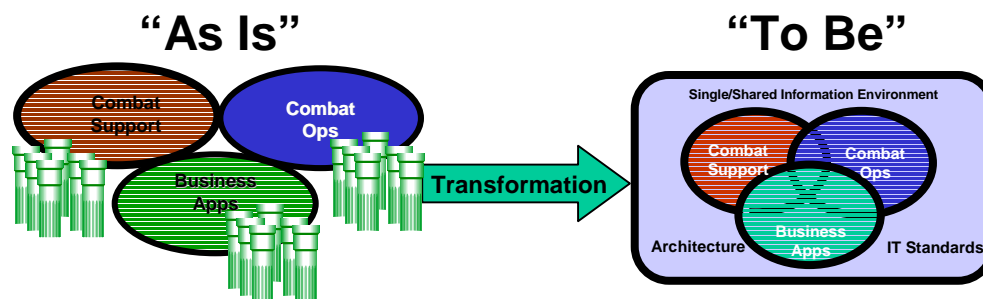
Enabling
Technologies

“IT as the enabler to transform AF business processes”



Strategy: How Do We Get There

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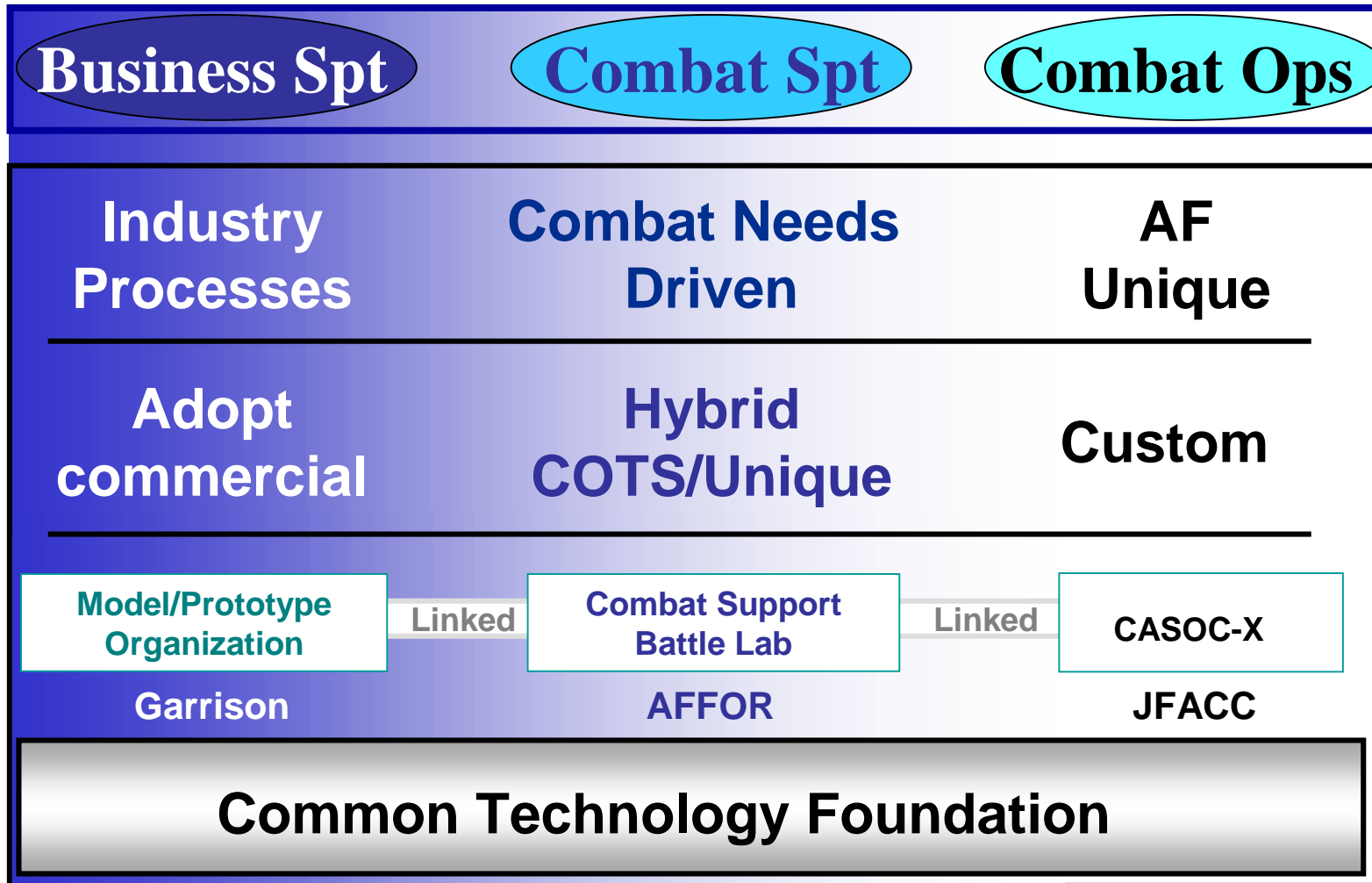
AF / Industry Lessons

- Link transformation to org strategy and goals
- Identify enterprise processes
- Put process owner in charge of transformation
- Minimize COTS changes/extensions
- Develop incrementally
- Use metrics
- Focus on change processes not s/w systems



Transformation Focus Areas

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Foundation Concepts for IT-Enabled Enterprise Transformation

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- **Build enterprise-wide business processes**
 - **Linked to AF mission objective**
 - **Commonality drives effectiveness and efficiency**
- **Leverage Industry trends and standards (e.g., Web)**
- **No “county options” for IT**
 - **Integrated, seamless, managed, infrastructure**
 - **Architecture and Standards compliance**
- **Clear data ownership and accountability**
 - **Information is an enterprise asset**
- **Resources tied to enterprise goals**
 - **CONOPS, architectures, and roadmaps drive POM**



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Software: Key Enabler of Weapon Systems

Software allows us to:

- **Add new combat capabilities for our warfighters**
- **Efficiently transition new technologies to our weapon systems**
- **Improve the sustainability of our weapon systems**





Software Trends and Challenges

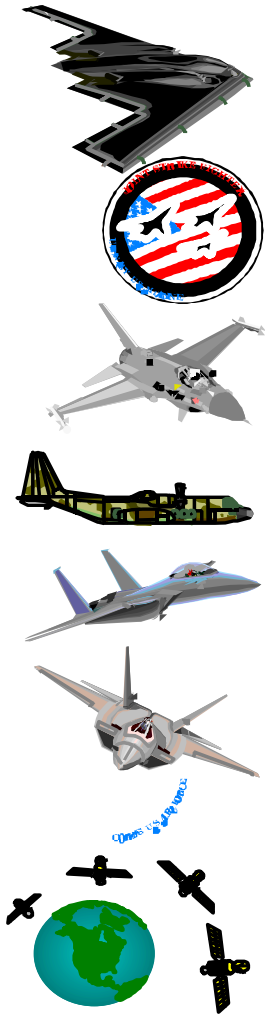
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- **Increasing reliance on commercial software results in changing skill needs**
- **Web and middleware tools offer new options for leveraging legacy software**
- **Rapid product evolution requires streamlined development/acquisition methods**
- **Legacy weapon system software increasingly difficult to support**
- **Difficult to develop and retain software skilled workforce**



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The Software vision



- **Software is an integral component of AF systems**
 - **Software issues must be addressed as a systems engineering issue in every phase of the life cycle**
- **Software challenges**
 - **Process improvement**
 - **Software technologies**
 - **Software S&T**
 - **Software policy**
 - **Software-knowledgeable workforce**



Software Process Improvement

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- **Improving processes and organizational maturity yields**
 - **More predictable cost and schedule**
 - **Less rework and lower defect rates**
 - **Less susceptibility to external factors (turnover, budget cuts)**

- **Model-based process improvement has a proven track record**
 - **Capability Maturity Models (CMMs) provide guidance for process improvement and a measure of maturity**
 - **Link software system to architecture**
 - **Rigorous tracking/management of funds**



Capability Maturity Model Integration (CMMI)

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- Consolidates the Software, Systems Engineering, and Integrated Product and Process Development CMMs in a single framework
- Improve engineering and product development
- Incorporates related international standards
- DoD working on policy to implement CMMI





USAF Architectures Architecture Council Structure

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AF SENIOR LEADERSHIP

AF/XI, AF/XO AF-CIO

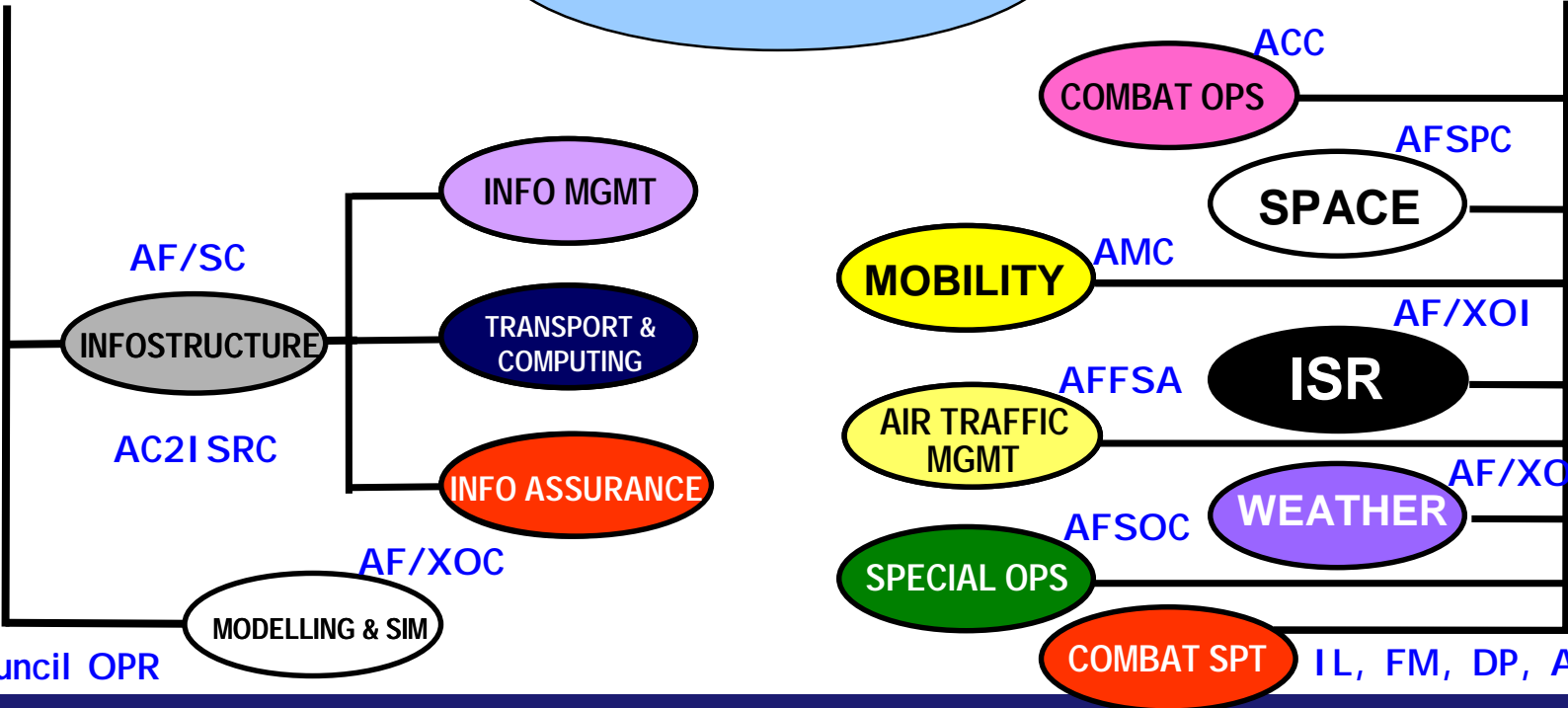
**CROSS CUTTING
ARCH COUNCILS**



**ENTERPRISE ARCHITECTURE
INTEGRATION COUNCIL**



**MISSION DOMAIN
ARCH COUNCILS**



XX = council OPR



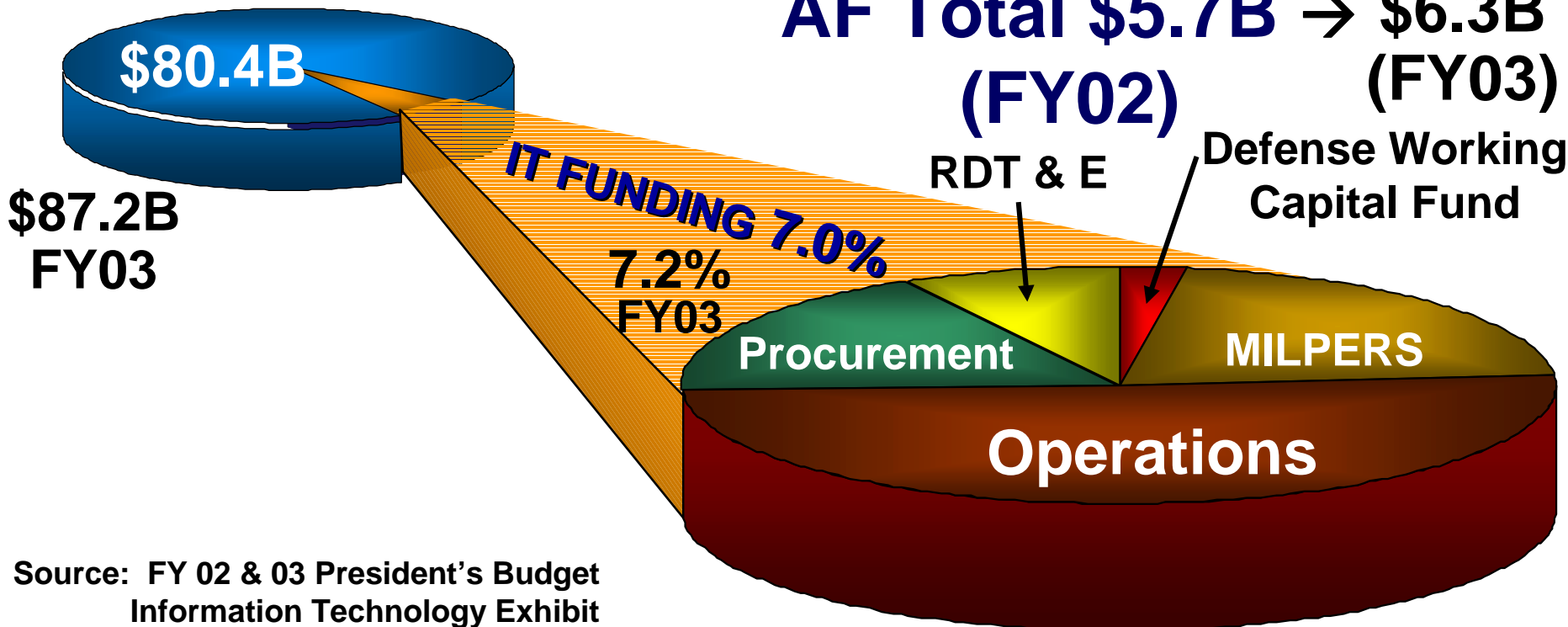
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Air Force IT Funding Budget --The Big Picture

DOD Total IT Budget \$22.9B → \$26.4B
(FY02) (FY03)

AF Total Blue TOA

AF Total \$5.7B → \$6.3B
(FY02) (FY03)



Source: FY 02 & 03 President's Budget
Information Technology Exhibit



Software Technologies

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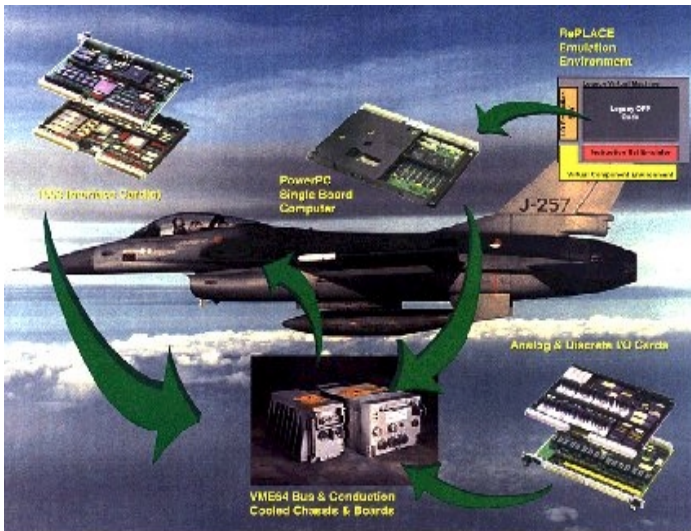
- Increase capabilities available to the warfighters
- Improve weapon systems sustainability
 - Reuse technologies – capitalize on legacy software
 - Incremental upgrade of aging aircraft components with COTS processors and components
- Improve software development capabilities





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Reconfigurable Aerospace Computer Emulator (RACE)



- Enables legacy software to run on open-systems hardware
 - Software emulators interface with new hardware
- Cost effectively upgrade legacy systems with commercial processors
- Flight tested on F-117 December 2001



Software S&T

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- **Need a strong software S&T program to meet unique or critical software needs**
 - Not addressed by industry
 - Need to work cooperatively with DoD
 - Need strategy for Congress
- **Sample DoD software S&T needs:**
 - Security/Assurity/Reliability
 - Real-Time Operations
 - Middleware integration
 - Software development tools





Software Policy Concerns

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- **Historically...no single forum for software policy, oversight, or guidance**
- **Last year SECAF and CSAF approved recommendations of the Weapon System Software Sustainment Study**
- **SAF/AQR and AF/IL agreed on need for an Air Force Software Steering Group to:**
 - **Provide AF focus on initiatives to improve software development and sustainment of weapon systems**
 - **Bridge activities of the DoD and AFMC Software Intensive Systems Steering Group**



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Air Force Software Steering Group

- Need recognized by Air Force leadership
- Draft charter developed
- Software Steering Group
 - Chaired by AF-CIO
 - Principal members are senior representatives from HAF organizations that influence development, acquisition, and sustainment policies (AF/XI, AF/IL, SAF/AQR, SAF/AQI, and AF/XO)
- **Result: Strategic direction for software management**



Personnel Issues

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- **Personnel stability is a problem for both organic and industry**
- **Difficult to hire and retain software engineers**
- **Highly competitive market**
- **Salary & benefits disparity between government and industry**

Impact:

- **Longer development schedules**
- **Increased (rate-capped) overtime and morale impacts**
- **Continued exodus from Defense business**



Personnel Issues ***-- What We're Doing***

- **Working retention issues**
 - **Slightly over 40% first term enlisted programmers reenlisted (goal 65%)**
 - **Approx 40% second term enlisted programmers have reenlisted this year (goal 75%)**
- **Reenlistment bonuses**
- **Special pay for GS-05 thru GS-12 civilian computer programmers**
- **Proposed special pay for officer and civilian engineers**



Implications...For You

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- **Software professionals must be part of the Air Force community of practice**
 - **Work with our systems engineers, sustainers and users**
- **Transform and improve our business practices**
 - **Mature and improve our business and development processes BUT**
 - **Must be performance oriented, not process oriented**
 - **Eliminate processes that do not support needed outcomes**





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Take Away

- Information is key to future operations
- Integrated and Managed IT infrastructure is the foundation
- Business-like practices provide necessary discipline

More combat capability



and efficiency



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Q & A

Questions?