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# Service Indicator Standard

Proposal for a New VITA Standard

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# Human involvement in effecting repairs

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- Problem anticipation; preventive maintenance
- Problem detection and identification
- Problem diagnosis and decision making
- Collecting tools and parts needed to make repairs
- Target location (locating the failed component)
- Removal and replacement of failed components
- Confirmation of restored function at the machine level
- Restoration of operation at the system or network level

MTTR and the probability of service error can be reduced by minimizing the MCTR (mean complexity to repair)

Any service error or delay costs time and \$\$.

# Problems that need to be solved

- No consistency in visual indicators (e.g., LEDs) on systems
  - number, usage, and meaning varies
- No universal standards
  - few within companies
  - component standards conflict (IB, power supplies, PCI)
- Behavior often combined with other types of indicators
  - confusion between system status, component status, and non-service related functions
- Inconsistent indicator behavior leads to human error
  - requires more education, skill, training, and experience
  - human errors are VERY costly

# Sun's solution

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- Conducted Human Factors research over 6 year period
- Established a collaboration between User Centered Design and Serviceability
- Focused down to a simple, limited, and direct solution
- Developed and verified (usability tested) the standard
- Got management buy-in to implement the standard in all Sun products
- Now evangelizing the standard industry-wide to make it a national/international standard

# Service Indicator Standard goals

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- Minimize the probability of human error in service ops
  - 1- eliminate ALL ambiguity
  - 2- provide CLEAR and IMMEDIATE feedback
  - 3- adhere to population stereotypes and existing standards where possible

# 1 - Eliminate ALL ambiguity

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- Provide a CLEAR identification of the problem
- Provide a CLEAR identification of the solution
- Assist in EASY and QUICK location of the target
- Provide CLEAR and IMMEDIATE feedback on the state of the target and the system
- Provide a CLEAR and IMMEDIATE go-no go command to proceed with the repair
- Provide CLEAR and IMMEDIATE feedback of success or failure of repair

# 2 - Provide effective feedback

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- Real-time status of network, system, and component
- Instantaneous feedback that commands were received
- Task progress (time remaining, steps complete, etc.)
- Unambiguous error messages
- Timely and unambiguous notification of success or failure

# 3 - Adhere to standards & stereotypes

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- Common usage of colors
- Common usage of icons
- Employ standard human factors coding methods
  - spacing
  - grouping
  - location
  - labeling
  - behavior

# The standard

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- Four distinct colors
- Four distinct meanings
- Each indicator is mutually exclusive of all others
- Blinking or flashing minimized and with intuitive meaning
- Minimum and maximum brightness specified

GREEN = normal

AMBER = service action or attention required

BLUE = service action allowed (“OK to remove”)

WHITE = locator (“Here I am”)

# The standard (continued)

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- Consistent location, spacing, and orientation
- Consistent labeling
- Consistent behaviors
- Indicator color ranges specified
- Same rules apply to FRUs and at the system level

# Our proposal to VITA

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- that VITA accept this Service Indicator Standard as a topic for further development as a VITA standard
- Craig Hartley from Sun Microsystems volunteers to chair the development committee

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