ARTESYN™
EMBEDDED TECHNOLOGIES

PICMG 3.7 – Extending the Standard for Higher Performance Footprint

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Why Extend Successful Standard

PICMG 3.0
10 Years of Growth

New Market Adoption

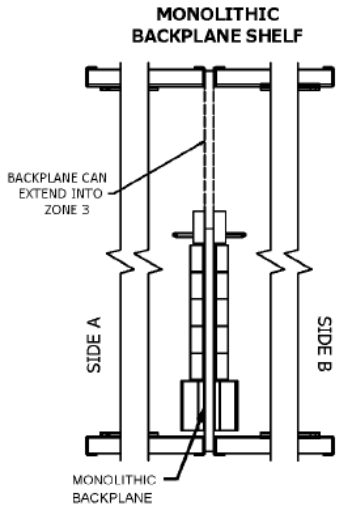
New Performance Requirements

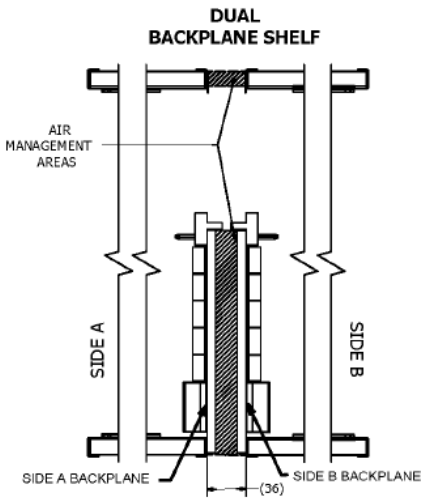
Goals of PICMG 3.7

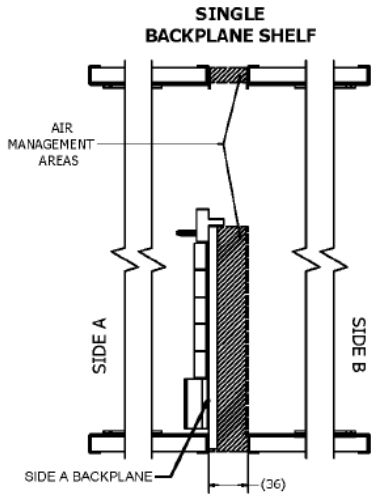
- Information Based on Draft R 8.0, DEC 2013
- Build on PICMG 3.0 by Extending the Standard
- Increase Performance Density
- Extend System Power and Cooling Capabilities
- Explicitly Support DC and AC Power Solutions
- Expand ATCA to new Environments
- Increase Base Interface to 10Gb
- While Maintaining Interoperability with PICMG 3.0

Expanding Shelf Definitions

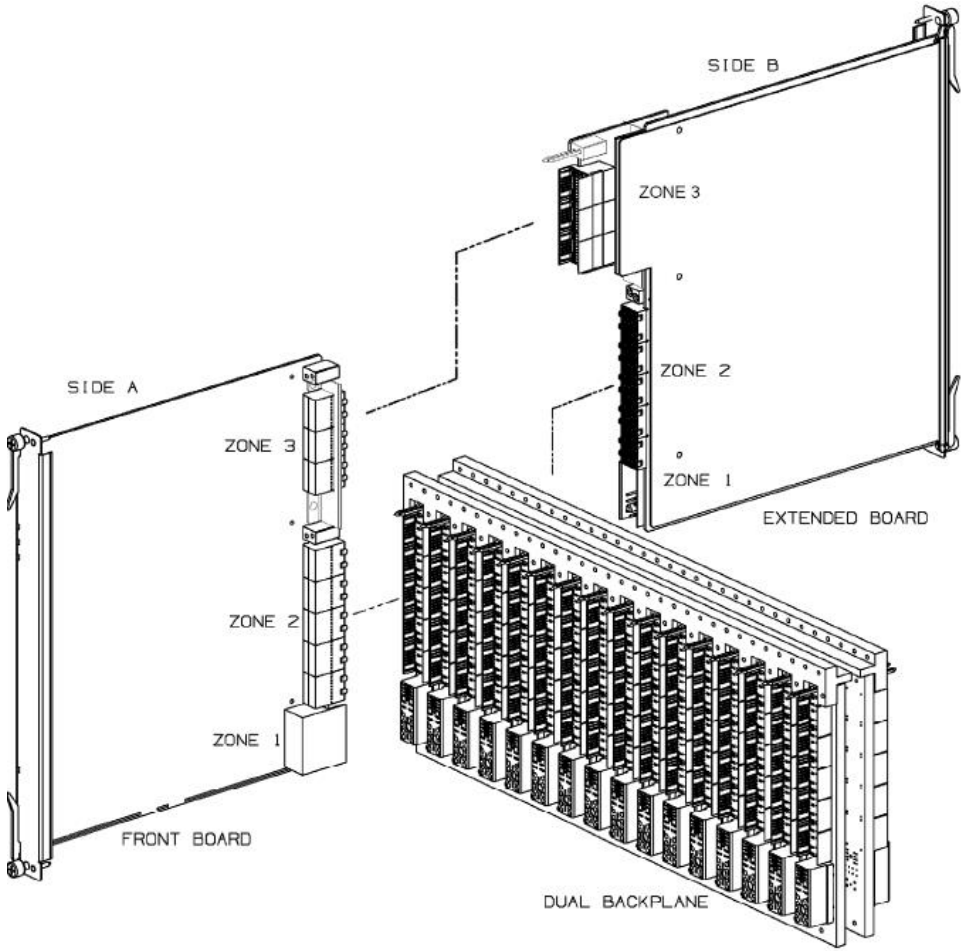
- Expand System Definition to Dual Sided Shelves
- New Shelf Definitions
  - Monolithic Backplane Shelf
  - Single Sided Backplane Shelf
  - Dual Backplane Shelf
- Increase Power Allowed by Zone 1 to 800W
- Dual Sided Systems are Deeper but no Depth is Defined in the Standard for Chassis





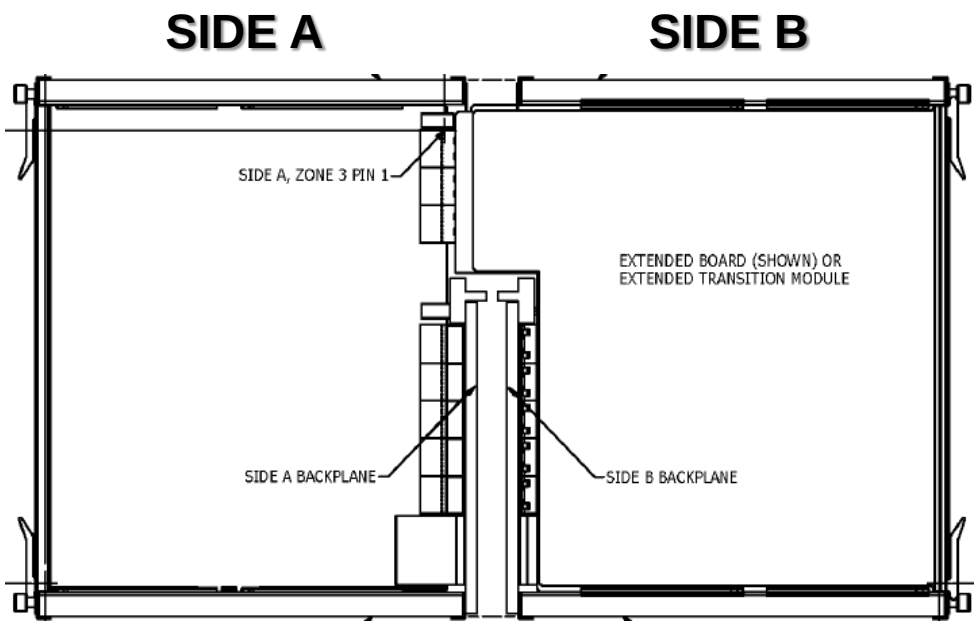


Expanding Rear Transition Modules



- Allows for Expanded RTM Area
- Extended Transition Modules
  - Zone 3 Connection Only
- Extended Boards
  - Zone 1
  - Zone 3
  - Or All 3 Zones
  - Work Cooperatively or Independently of Front Board

Expanding Rear Transition Modules



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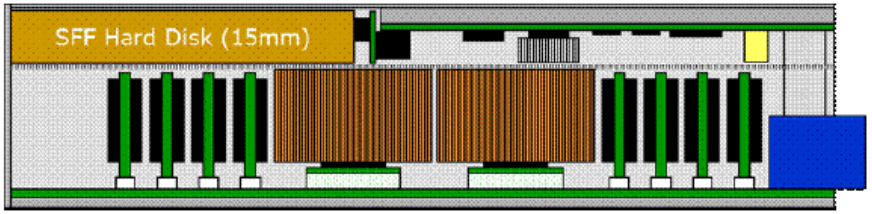
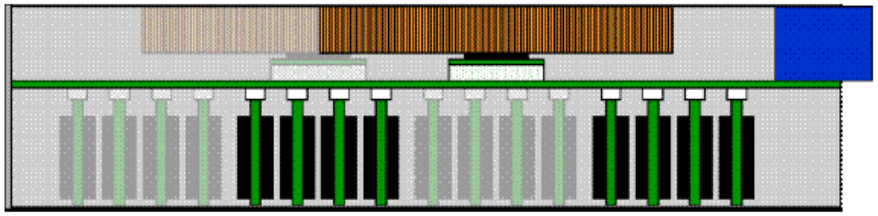
Increasing Payload Capability

- Double Wide Boards Defined Since PICMG 3.0
- PICMG 3.7 Expands Pitch Width and PCB Orientation
  - Left Aligned Module
  - Center Aligned Module
- Applies to the new Extended Mezzanines and Extended Boards

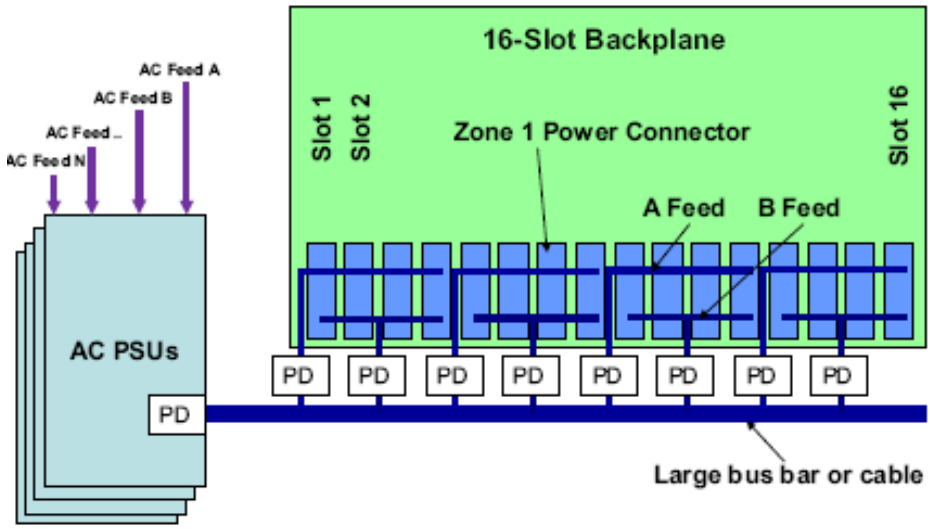
Left Aligned



Center Aligned

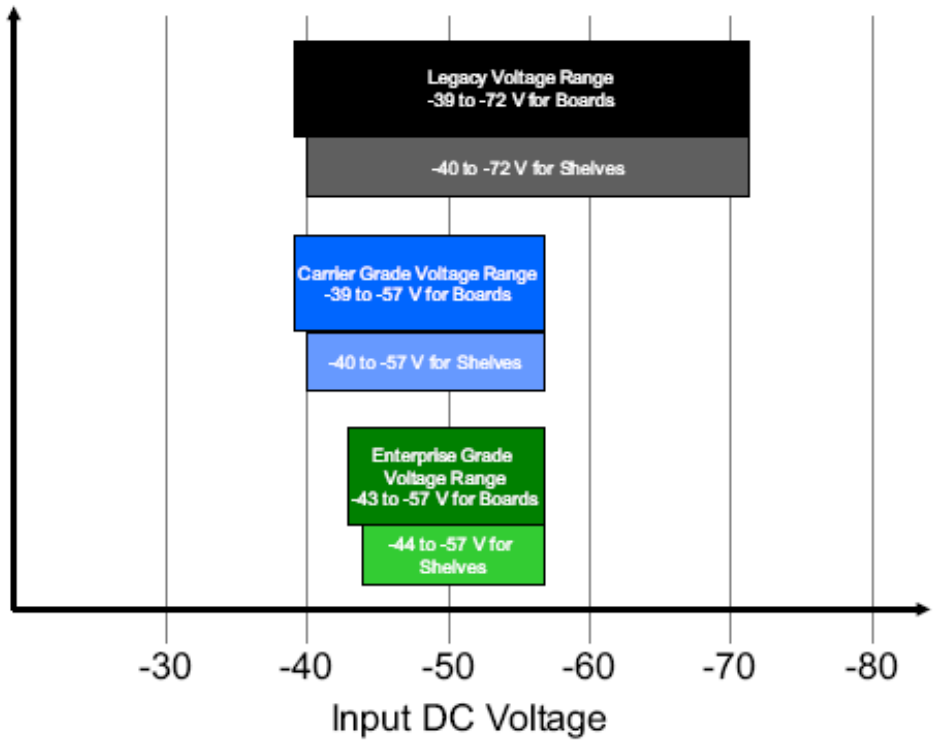


Expanded Power



- AC Options can be Used
  - Must Supply -48VDC to Backplane
- PICMG 3.7 Allows for -60VDC to reduce cost
- Defines 3 Operational Voltage Ranges (Improve Cost)
  - Legacy (-60VDC and -48VDC)
  - Carrier Grade (-48VDC)
  - Enterprise Grade (-48VDC)

Expanded Power



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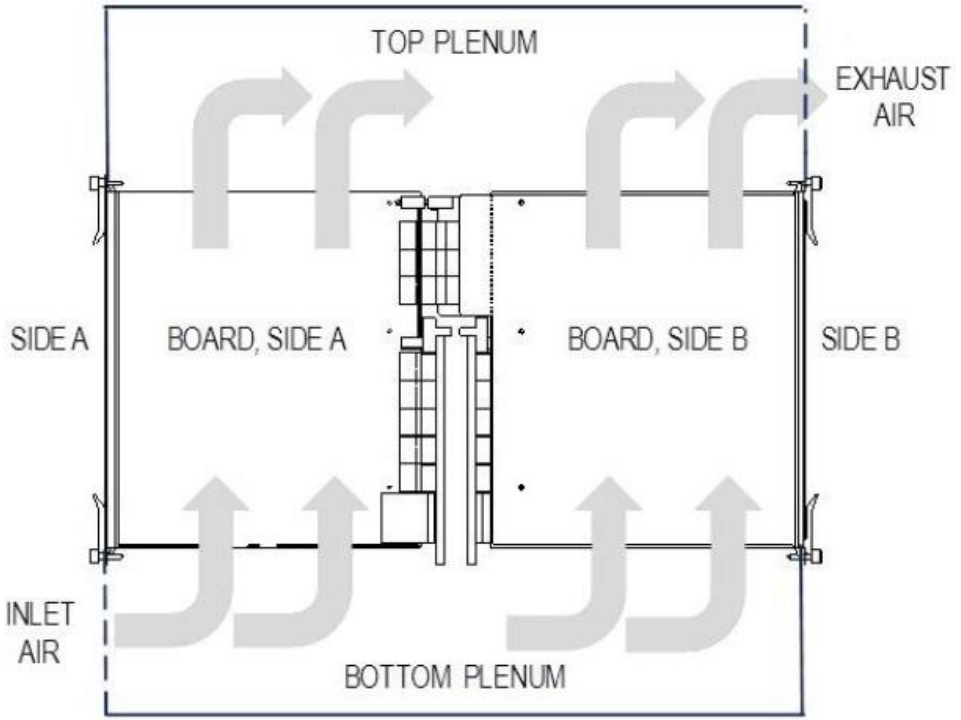
New Cooling Requirements

- New Expanded Rear Sub-Chassis will Require More Cooling then Traditional RTM
- Worse Case Power for a 32 Slot System at 800W is 25KW
- Expanded Power on Boards Require Greater Air Flow
- Detailed Analysis and Cooling Guidelines Now part of the Standard
- New Requirements For Board Vendors to Supply Air Flow Characteristics of Board
- Shelf Cooling Capability Now Part of PICMG 3.7



Cooling Performance Levels

- Performance Profiles Included with PICMG 3.7
  - Central Office
  - Data Center
- Additional Cooling Classes for Systems
- Performance Compliance Separates Carrier vs. Data Center Operations

Max. Blade Power per class; Single-Wide Blades (Front)		Data Center Climatics & ΔT Profile								Central Office Climatics & ΔT Profile					
		GR-3160 min.	GR-3160 exp.	ASHRAE A1	ASHRAE A2	ASHRAE A3	ETSI 3.1E (DC)	ASHRAE A4	GR-63 Lvl-2 S(M)	GR-63 Lvl-3 F(M)	GR-63 Lvl-3 S(M)	ETSI 3.1E (CO)	GR-63 Lvl-3 F(M+O)	GR-63 Lvl-3 S(M+O)	
		1.0240	0.9934	0.8055	0.7951	0.7929	0.7932	0.9779	0.8896	1.0758	1.0594	0.7513	0.8621	0.8490	ρ [kg/m3]
Class	SW [ACFM]	20.1	17.6	22.4	21.4	21.4	21.2	16.0	17.6	12.0	10.0	14.1	12.0	10.0	ΔT [°C]
B.1	25	245	208	214	202	202	200	186	186	154	126	126	123	101	Wmax [W]
B.2	30	294	249	257	243	242	240	223	223	185	151	151	148	121	Wmax [W]
B.3	35	343	291	300	283	282	280	260	260	215	176	176	173	141	Wmax [W]
B.4/C.4	40	392	332	343	324	323	321	298	298	246	201	201	197	161	Wmax [W]
C.5	50	490	415	428	405	404	401	372	372	308	252	251	247	202	Wmax [W]
C.6	60	588	499	514	486	484	481	446	446	369	302	301	296	242	Wmax [W]
C.7	70	686	582	600	566	565	561	521	521	431	353	352	345	283	Wmax [W]
C.8	80	784	665	685	647	646	641	595	595	492	403	402	395	323	Wmax [W]
C.9	90	882	748	771	728	726	721	670	670	554	453	452	444	363	Wmax [W]
C.10	100	980	831	856	809	807	801	744	744	615	504	502	493	404	Wmax [W]
Max. Blade Power per class; Double-Wide Blades (Front)		Data Center Climatics & ΔT Profile								Central Office Climatics & ΔT Profile					
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Class	DW [ACFM]	20.1	17.6	22.4	21.4	21.4	21.2	16.0	17.6	12.0	10.0	14.1	12.0	10.0	ΔT [°C]
B.1	50	490	415	428	405	404	401	372	372	308	252	251	247	202	Wmax [W]
B.2	60	588	499	514	486	484	481	446	446	369	302	301	296	242	Wmax [W]
B.3	70	686	582	600	566	565	561	521	521	431	353	352	345	283	Wmax [W]
B.4/C.4	80	784	665	685	647	646	641	595	595	492	403	402	395	323	Wmax [W]
C.5	100	980	831	856	809	807	801	744	744	615	504	502	493	404	Wmax [W]
C.6	120	1176	997	1028	971	968	962	893	893	738	604	603	592	484	Wmax [W]
C.7	140	1372	1163	1199	1133	1130	1122	1041	1042	862	705	703	690	565	Wmax [W]
C.8	160	1569	1329	1370	1295	1291	1282	1190	1190	985	806	804	789	646	Wmax [W]
C.9	180	1765	1496	1542	1457	1453	1443	1339	1339	1108	907	904	888	727	Wmax [W]
C.10	200	1961	1662	1713	1619	1614	1603	1488	1488	1231	1007	1005	986	807	Wmax [W]
Power Connection, Excluding RTM power:							> ~800W		~400 … ~800W		~200 … ~400W		< ~200W		

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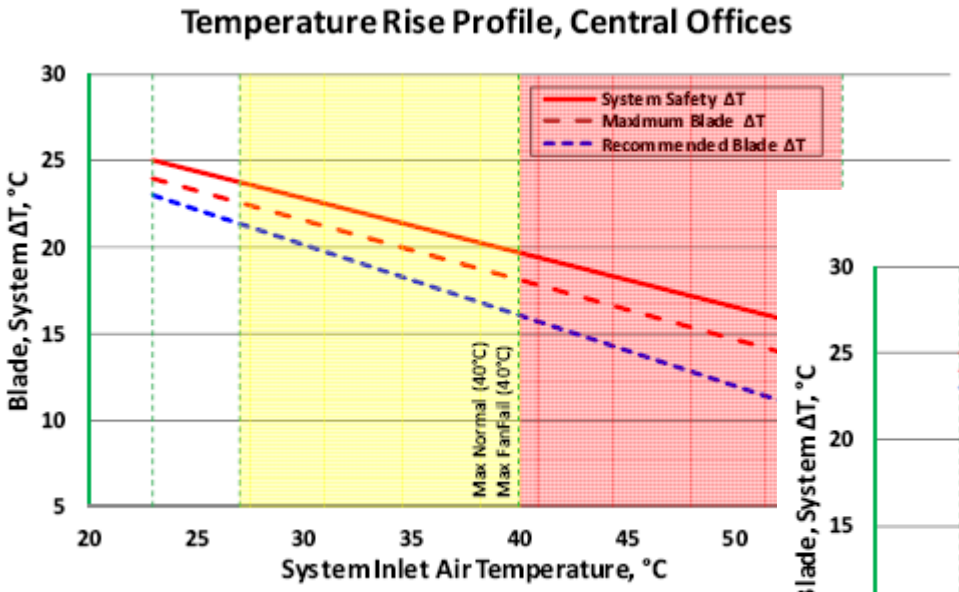

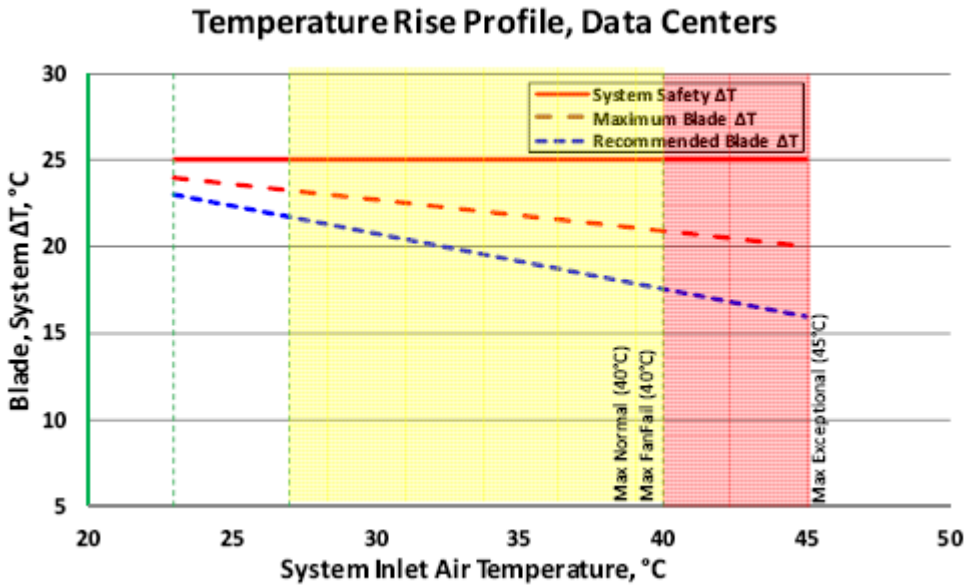

Additional Enhancements

- Data Transport Expansion
  - BASE Interface Moving to 10GBASE-T
  - Still Must Support 1000BASE-T
- Provisions for Redundant Hub Blades for Dual Sided Configurations
- A Large Portion of PICMG 3.7 is Dedicated to the Hardware Platform Management Expansion to Accommodate the new Expanded Shelf and Board Capabilities