



**PROGRAM  
REGIONALNY**  
NARODOWA STRATEGIA SPÓJNOŚCI



**Małopolska**

UNIA EUROPEJSKA  
EUROPEJSKI FUNDUSZ  
ROZWOJU REGIONALNEGO



# **MAŁOPOLSKA KARTA AGLOMERACYJNA — SYSTEM ZARZĄDZANIA TRANSPORTEM ZBIOROWYM W WOJEWÓDZTWIE MAŁOPOLSKIM**

## **CZĘŚĆ I — BUDOWA SYSTEMU ZARZĄDZANIA TRANSPORTEM ZBIOROWYM NA TERENIE WOJEWÓDZTWA MAŁOPOLSKIEGO**

### **SPECYFIKACJA SPRZĘTU SERWEROWEGO**



| Historia zmian |            |      |       |       |
|----------------|------------|------|-------|-------|
| Wersja         | Data       | Opis | Autor | Uwagi |
| 0.1            | 2015-01-01 |      |       |       |
| 0.2            |            |      |       |       |
| 0.3            |            |      |       |       |
|                |            |      |       |       |

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## Historia zmian

| Wersja | Data       | Opis       | Autor   | Uwagi |
|--------|------------|------------|---------|-------|
| 0.1    | 2015-03-17 | Utworzenie | AMG.net |       |
|        |            |            |         |       |
|        |            |            |         |       |

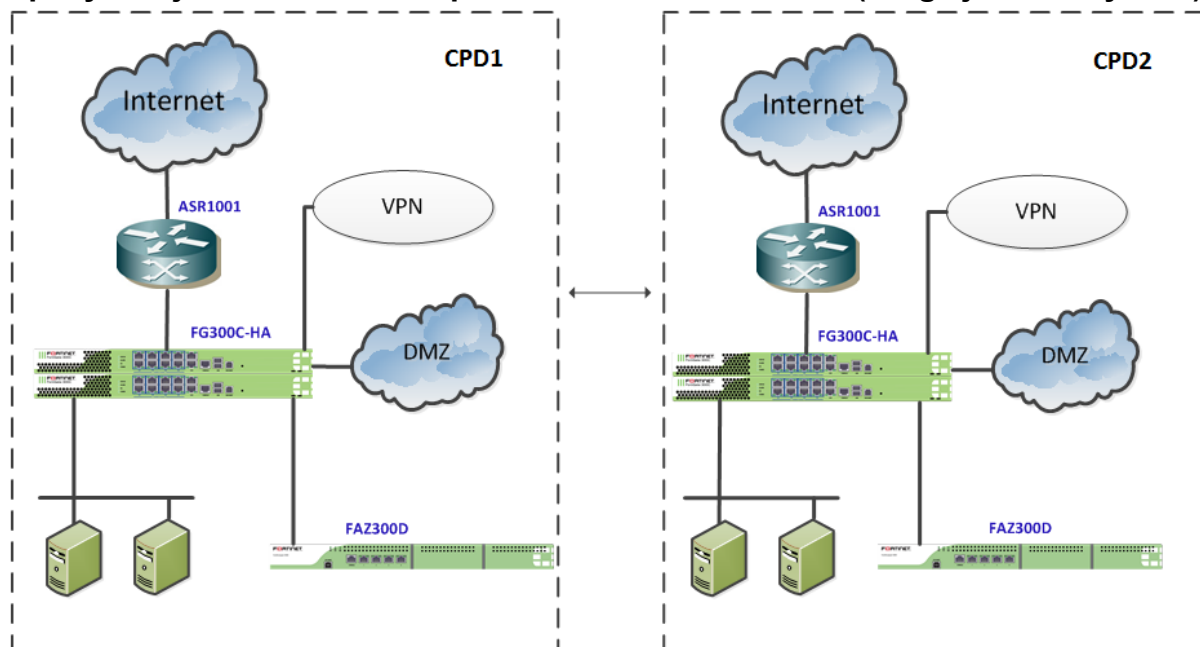
## 1. Wstęp

Niniejszy dokument jest częścią Dokumentacji technicznej. Zawiera techniczną specyfikację sprzętu serwerowego.

Dokument został uzupełniony na podstawie zmian wynikających z prac wdrożeniowych.

## 2. Specyfikacja techniczna komponentów

Specyfikacja techniczna komponentów w 1 serwerowni (druga jest identyczna)



### 2.1. Serwery

|                                           |                                        |
|-------------------------------------------|----------------------------------------|
| Producent                                 | HP                                     |
| Model zestawu                             | HP BladeSystem c7000                   |
| Ilość zestawów                            | 2 szafy blade                          |
| Architektura procesorów                   | W architekturze x86-64                 |
| Model jednostki obliczeniowej             | Serwer blade HP ProLiant BL680c        |
| Ilość jednostek obliczeniowych w zestawie | 6 serwerów blade, po 3 w każdej szafie |



|                                            |                                                                            |
|--------------------------------------------|----------------------------------------------------------------------------|
| <b>Pamięć RAM jednostki obliczeniowej</b>  | 64 GB wyposażona w mechanizm ECC                                           |
| <b>Model procesora</b>                     | Intel® Xeon® Processor E7-4850 (24M Cache, 2.00 GHz, 6.40 GT/s Intel® QPI) |
| <b>Ilość procesorów w zestawie</b>         | 6 procesorów                                                               |
| <b>Łączna ilość rdzeni w zestawie</b>      | 60                                                                         |
| <b>Dyski</b>                               | 4 dyski 500GB 6G SAS 7.2K 2.5 w każdym serwerze blade                      |
| <b>Łączna ilość pamięci RAM w zestawie</b> | 192 GB wyposażona w mechanizm ECC w każdej szafie, 384 w serwerowni        |
| <b>Karty FC</b>                            | W sumie 12 portów, po 6 w szafie, po 2 na serwer blade                     |
| <b>Porty LAN</b>                           | 6 kart dwuportowych 10Gb w 2 szafach, po 2 porty na serwer                 |
| <b>Partycjonowanie</b>                     | Nie                                                                        |

| Produkt     | Opis                                     | Liczba |
|-------------|------------------------------------------|--------|
| 681840-B21  | HP BLc7000 1PH 2PS 4Fan Trl IC Plat Encl | 4      |
| HA104A4     | HP 4y 4h 24x7 HW Support                 | 1      |
| HA104A4 7FX | c7000 Enclosure HW Supp                  | 4      |
| AJ820B      | HP B-series 8/12c BladeSystem SAN Switch | 8      |
| H7J34A4     | HP 4yr Foundation Care 24x7 Service      | 1      |
| H7J34A4 85J | Brocade 4/12 and 4/24 SAN Switch Supp    | 8      |
| 451439-B21  | HP BLc Cisco 1/10GbE 3120X Switch        | 16     |
| 378929-B21  | Cisco Enet SX Fiber SFP Module           | 32     |
| 588603-B21  | HP 2400W Plat Ht Plg Pwr Supply Kit      | 16     |
| 412140-B21  | HP BLc Encl Single Fan Option            | 24     |
| QK734A      | HP Premier Flex LC/LC OM4 2f 5m Cbl      | 32     |
| 456204-B21  | HP BLc7000 DDR2 Encl Mgmt Option         | 4      |
| AJ716B      | HP 8Gb Short Wave B-Series SFP+ 1 Pack   | 16     |
| 643781-B21  | HP BL680c G7 E7-4850 64G Svr             | 12     |
| HA104A4     | HP 4y 4h 24x7 HW Support                 | 1      |
| HA104A4 7XF | BL6xxc Svr Bld HW Support                | 12     |

|             |                                                             |    |
|-------------|-------------------------------------------------------------|----|
| 507610-B21  | HP 500GB 6G SAS 7.2K 2.5in DP MDL HDD                       | 24 |
| 613431-B21  | HP BLc NC553m DP FlexFabric Adptr Opt                       | 12 |
| 451871-B21  | HP BLc QLogic QMH2562 8Gb FC HBA Opt                        | 12 |
| C6N36AAE    | HP Insight Control ML/DL/BL Bundle E-LTU                    | 12 |
| J9575A      | HP 3800-24G-2SFP+ Switch                                    | 4  |
| J9575A ABB  | Europe - English localization                               | 4  |
| J9577A      | HP 3800 4-port Stacking Module                              | 4  |
| J9579A      | HP 3800 3m Stacking Cable                                   | 4  |
| J9150A      | HP X132 10G SFP+ LC SR Transceiver                          | 8  |
| U3MF9E      | Foundation Care NBD Exchange SVC, HW and SW Support, 4 year | 4  |
| AM867B      | HP 8/8 (8)-ports Enabled SAN Switch                         | 4  |
| AM867B ABB  | Europe - English localization                               | 4  |
| H7J32A4     | HP 4Yr Foundation Care NBD Service                          | 1  |
| H7J32A4 9LJ | HP B-Series 8/8 and 8/24 Switch Support                     | 4  |
| AJ716B      | HP 8Gb Short Wave B-Series SFP+ 1 Pack                      | 32 |

## 2.2. Pamięci masowe i macierze

|           |         |
|-----------|---------|
| Ilość     | 1       |
| Producent | EMC     |
| Model     | VNC5100 |



|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Specyfikacja techniczna</b> | <p>Min/Max Drives<br/>4/75</p> <p>Array Enclosure 3U Disk Processor Enclosure (15x3.5" or 25x25") Standby Power System 1U 1.2KW</p> <p>Raid Options 0/1/10/3/5/6</p> <p>CPU/Memory per Array Intel Xeon 5600/8GB</p> <p>Embedded IO Ports per Array 8 FC ports and 4 SAS ports</p> <p>Max Total Ports per Array 8</p> <p>2/4/8 Gb/s FC Max 8</p> <p>6Gb/s SAS Buses 2</p> <p>Max Raw Capacity 225TB</p> <p>Max SAN Hosts: 512</p> <p>Max Number of Pools 10</p> <p>Max Number of LUNs 512</p> <p>Max LUN Size 16 TB (Virtual Pool LUN)</p> <p>Protocols supported:<br/>Lock Manager (NLM) v 1,3,4<br/>ICMP<br/>LDAP<br/>Kerberos Authentication<br/>Ethernet Trunking<br/>Microsoft DFS<br/>iSCSI, FC (FCP SCSI-3), FCoE</p> <p>NT LAN Manager (NTLM)</p> <p>NTPS<br/>SNMP V1-V3<br/>NTP<br/>Virtual LAN (IEEE 802.1q)</p> <p>Windows, Linux</p> <p>Operating Temperatures: 10-40 C</p> <p>Relative Humidity 20%-80% non-condensing</p> <p>Altitude: 2286m 40 C 3048m 37C</p> |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Produkt       | Opis                                     | Liczba |
|---------------|------------------------------------------|--------|
| VNX51D159010F | VNX5100 DPE 15 X 3.5 DRV 6 X 900 10K FLD | 1      |
| V3-VS10-900   | 3.5 IN 900GB 10K SAS DISK DRIVE          | 9      |
| V13-PWR-7     | 2 C13 PWR CORDS W/ CEE7/7 PLUGS 250V 10A | 2      |
| VNXFCSFPS     | ADDITIONAL 8 G FC SFP FOR VNX 51/53      | 1      |
| ESRS-GW-200   | EMC SECURE REMOTE SUPPORT GATEWAY CLIENT | 1      |
| VNX51-KIT     | DOCUMENTATION KIT FOR VNX5100            | 1      |
| PSINST-ESRS   | ZERO DOLLAR ESRS INSTALL                 | 1      |
| M-PREHW-001   | PREMIUM HARDWARE SUPPORT                 | 1      |
| M-PRESW-001   | PREMIUM SOFTWARE SUPPORT                 | 1      |
| WU-PREHW-001  | PREMIUM HARDWARE SUPPORT - WARR UPG      | 1      |
| VNXSPSAS      | 2ND OPTIONAL SPS FOR VNX 51/53           | 1      |
| UNIB-V51      | Unisphere Block & VNX OE VNX5100         | 1      |
| C13-PWR-7     | 2 C13 PWR CORDS W/ CEE7/7 PLUGS 250V 10A | 2      |
| 456-100-309   | AVAMAR 1 TB INCR CAPACITY LICENSE        | 14     |
| 456-103-950   | Backup and Recovery Manager Avamar       | 1      |

|               |                                         |   |
|---------------|-----------------------------------------|---|
| M-PRESWDD-H1  | PREMIUM SOFTWARE SUPPORT (DD)           | 1 |
| WU-PREHWB-M00 | Premium Hardware Support-WARR UPG(ANDL) | 1 |
| M-PREHWDP-M1  | PREMIUM HARDWARE SUPPORT                | 1 |
| AVMA2400FG4S  | AVAMAR G4S M2400 STORAGE NODE FLD INST  | 2 |
| C13-PWR-7     | 2 C13 PWRCORDS W/ CEE7/7 PLUGS 250V 10A | 4 |
| DSBRLKT-B     | DSB SW GEN RCK KIT -B                   | 4 |
| DS-300B-8G    | DS-300B 8/24P 8G BASE SWITCH            | 4 |
| M-PREHW-001   | PREMIUM HARDWARE SUPPORT                | 1 |
| WU-PREHW-001  | PREMIUM HARDWARE SUPPORT - WARR UPG     |   |

### 2.3. Urządzenia sieciowe

|                  |                |
|------------------|----------------|
| <b>Ilość</b>     | 1              |
| <b>Producent</b> | Cisco          |
| <b>Model</b>     | ASR1001 System |



|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Specyfikacja<br/>techniczna</b></p> | <p><u>Software compatibility</u><br/>Cisco IOS XE Operating System, which is based on Cisco IOS Software Release 12.2SR<br/>(Please consult your Cisco account representative for additional details.)<br/>Software protocols<br/>Refer to Cisco IOS Software 12.2SR protocol support<br/>Connectivity<br/> <ul style="list-style-type: none"> <li>• Console port (RJ-45 connector)</li> <li>• Auxiliary port (RJ-45 connector)</li> <li>• 10/100/1000 Ethernet port (RJ-45 connector)</li> <li>• Two RJ-48 connectors for BITS input clocks</li> </ul> <u>Memory options</u> <ul style="list-style-type: none"> <li>• Two 1-GB Double Data Rate 2 (DDR2) mini-DIMMs</li> <li>• Two 2-GB DDR2 mini-DIMMs</li> <li>• Upgradable memory from 2-GB to 4-GB DRAM</li> </ul> <u>Storage options</u> <ul style="list-style-type: none"> <li>• 40-GB HDD (RP1 only)</li> <li>• 1-GB USB Compact Flash memory</li> </ul> <u>Performance</u> <ul style="list-style-type: none"> <li>• Scalability up to 1,000,000 IPv4 routes or 500,000 IPv6 routes</li> <li>• BGP RR Scalability up to 5,000,000 IPv4 routes or 3,000,000 IPv6 routes</li> </ul> <u>Reliability and availability</u> <ul style="list-style-type: none"> <li>• 1 + 1 redundancy in dual-route-processor configuration</li> <li>• Support for online insertion and removal (OIR)</li> <li>• Support for NSF and Stateful Switchover (SSO)</li> <li>• Support for ISSU</li> </ul> <u>MIBs</u> <ul style="list-style-type: none"> <li>• RFC 2737 compliant</li> </ul> <u>Network management</u> <ul style="list-style-type: none"> <li>• Telnet and Secure Shell (SSH) Protocol (command-line interface [CLI])</li> <li>• Console port (through the CLI)</li> <li>• Simple Network Management Protocol (SNMP)</li> <li>• RFC 2665</li> </ul> LEDs<br/> <ul style="list-style-type: none"> <li>• PWR - Power<br/>Green - All power rails are within specifications</li> <li>• STAT - Status<br/>Green - Cisco IOS Software has booted<br/>Yellow - BootROM has successfully loaded<br/>Red - System failure or during boot process</li> <li>• ACTV- Active<br/>Green - Active route processor</li> <li>• STBY - Standby<br/>Yellow - Standby route processor</li> <li>• CRIT - Critical<br/>Red - Critical alarm or during boot process</li> <li>• MAJ - Major<br/>Red - Major alarm</li> <li>• MIN - Minor<br/>Amber - Minor alarm</li> <li>• LINK - Management Ethernet link status<br/>Solid green - Link with no activity<br/>FLASH green - Link with activity</li> </ul> </p> |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Produkt           | Opis                                               | Ilość |
|-------------------|----------------------------------------------------|-------|
| ASR1001           | Cisco ASR1001 System Crypto 4 built-in GE Dual P/S | 2     |
| CON-PSRT-CASR1001 | PRTNR SS 8X5XNBD Cisco ASR1001 SystemCrypto        | 8     |
| SFP-GE-T          | 1000BASE-T SFP (NEBS 3 ESD)                        | 6     |
| M-ASR1K-1001-4GB  | Cisco ASR1001 4GB DRAM                             | 4     |
| ASR1001-PWR-AC    | Cisco ASR1001 AC Power Supply                      | 4     |
| CAB-ACE-RA        | Power Cord Europe Right Angle                      | 4     |
| SASR1001UK9-39S   | Cisco ASR 1001 IOS XE UNIVERSAL                    | 2     |
| SLASR1-IPB        | Cisco ASR 1000 IP BASE License                     | 2     |
| CON-PSRT-SLASR1IK | PRTNR SS 8X5XNBD Cisco ASR 1000 IP BASE License    | 8     |

## 2.4. Specjalistyczne urządzenia IT

### Szafa rack

|           |     |
|-----------|-----|
| Ilość     | 1   |
| Producent |     |
| Model     |     |
| Wysokość  | 47U |
| Monitor   |     |

## 2.5. Załączniki

| Nazwa                  | Opis                    |
|------------------------|-------------------------|
| EMC VNX5100/VNX5300    | Macierz dyskowa         |
| FortiGate -300C        | Firewall sprzętowy      |
| HP BladeSystem c7000   | Obudowa Blade           |
| Cisco ASR 1001         | Router                  |
| EMC AVAMAR             | System archiwizujący    |
| EMC CONNCETRIX DS-300B | System pamięci masowych |



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