

PBS PROFESSIONAL VS. MICROSOFT HPC PACK

On the Microsoft Windows Platform PBS Professional offers many features which are not supported by Microsoft HPC Pack.

SOME OF THE IMPORTANT ADVANTAGES OF PBS PROFESSIONAL ARE:

- Support of Windows and Linux platforms
- More job ordering and job priority options
- More queuing options
- Time slot allocation and job classes
- Professional support provided

A comprehensive comparison between PBS Professional and MS HPC Pack is provided below.

PBS PRO VS. MS HPC

S. NO.	FEATURES	SUB-FEATURES	MS HPC	PBS PRO
1	PLATFORM SUPPORT	Windows Unix/Linux	Yes No	Yes Yes
2	HIGH AVAILABILITY/ FAILOVER SUPPORT	Supported? Built-in support? HPC Server 2008 R2 HPC Server 2012	Yes Supported through Windows HA functionality Supported only on Datacentre and Enterprise additions which is expensive Supported with all editions	Yes Yes Supported with all editions Supported with all editions
3	EXTREME SCALABILITY / PERFORMANCE	Scales to hundreds of thousands of cores	No numbers published	Yes
4	NETWORK TOPOLOGY SUPPORT	Supported? Flexible?	Yes No. Only 5 fixed configurations are supported.	Yes Yes
5	JOB ORDERING	Supported? Priority based FCFS Strict Ordering Round Robin Queue order By Queue order Job Sort Formula Multiple Queues and Queue Priorities Starving Jobs Fairshare Sorting jobs on one or more keys e.g. resource	Yes Yes No No No No No No No No	Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes
6	FINE GRAINED CONTROL	Supported? Server Level Limits Queue Level Limits Individual Limits Generic Limits	Yes Yes No. No support for Multiple queues. Yes No	Yes Yes Yes Yes Yes

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7	MPI SUPPORT	Intel MPI	No	Yes
		MPICH2	No	Yes
		MS MPI	Yes	No
		Extensible to other MPI implementations?	No	Yes
8	SYSTEM HEALTH REPORTING	Supported?	Yes	Yes
9	USER ROLES	Supported?	Yes	Yes
		Access to the Server	Yes	Yes
		Access to the Queue	No	Yes
		Access to the Reservation	No	Yes
10	QUEUES	Supported?	Yes	Yes
		Multiple Queues	No	Yes
		Queue Priorities	No	Yes
		Routing Queues	No	Yes
		Express Queues	No	Yes
		Queue Attributes	No	Yes
		Queue-based Access	No	Yes
		Control Lists	No	Yes
11	JOB PRIORITY	Supported?	Yes	Yes
		Different execution and pre-emption priorities	No	Yes
		Prioritizing jobs using wait time	No	Yes
		Job sort formula	No	Yes
		Sorting Jobs using key	No	Yes
		Using Queue Priority while computing Job Priority	No	Yes
		Fairshare	No	Yes
		Sorting Jobs using requested Priority	No	Yes
12	CUSTOM RESOURCES	Supported?	No	Yes
		Static Resources	No	Yes
		Dynamic Resources	No	Yes
		Server Level Resources	No	Yes
		Host Level Resources	No	Yes
		Shared Resources	No	Yes
13	DEPENDENCY	Supported?	Yes	Yes
		Job Level Dependency	Yes	Yes
		Task Level Dependency	Yes	No
14	JOB PLACEMENT OPTIMIZATION	Supported?	Yes	Yes
		Node grouping / Placement sets	Yes	Yes
		Peer Scheduling	No	Yes
		Load Balancing	No	Yes
		SMP Cluster Distribution	No	Yes
		Cycle Harvesting	Yes. On Windows 7. On limited editions.	Yes

S. NO.	FEATURES	SUB-FEATURES	MS HPC	PBS PRO
15	SHARED AND EXCLUSIVE RESOURCES	Supported?	No	Yes
16	SHARED AND EXCLUSIVE NODE	Supported?	Yes	Yes
17	CLOUD BURST	Supported Extensible to any cloud	Yes No. Only Azure.	Yes Yes
18	PREEMPTION	Supported? Preemption Priority Preemption Level Preemption Priority different than Job Execution Priority Method: Checkpointing Method: Suspension Method: Requeueing Graceful and immediate Preemption	Yes Yes No No No No No Yes	Yes Yes Yes Yes Yes Yes Yes Has better methods of preemption as listed above
19	BACKFILLING	Supported? Backfill look ahead Estimated Start time Primetime Support	Yes Yes Yes No	Yes Yes Yes Yes
20	FILTERS	Supported? Submission Filters Activation/execution filters Run various other hooks triggered at other events e.g. job change, job move, and also at server and host level Periodic hooks	Yes Yes Yes No No	Yes Yes Yes Yes Yes
21	TIME SLOT ALLOCATION	Supported? Standing Reservations Advanced Reservations Prime time Dedicated time Holidays	No No No No No No	Yes Yes Yes Yes Yes Yes
22	JOB CLASSES	Supported? Reservation Starving Suspended Express	No No No No No	Yes Yes Yes Yes Yes
23	NODE ORDERING	Supported?	Yes	Yes (node_sort_key)
24	LICENSE AWARE SCHEDULING	Supported?	Yes	Yes
25	RE-RUNNABLE JOBS	Supported?	Yes	Yes
26	JOB SCHEDULER INTERFACE API SUPPORT	Supported?	Yes	Yes

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27	NODE PREP AND RELEASE	Supported?	Yes	Yes (Prologue and Epilogue)
28	PARAMETRIC SWEEP	Supported?	Yes	Yes (Array Jobs)
29	LOGGING, TRACING, DIAGNOSIS, DEBUGGING SUPPORT	Supported?	Yes	Yes
30	SECURITY CERTIFICATION	EAL3+	No	Yes
31	JOB SUBMISSION AND MONITORING GUI	Supported?	Yes	Yes
32	ANALYTICS	Supported?	Yes	Yes
33	JOB TASKS	Supported?	Yes	Yes
		Task Based Granularity	Yes	No
		Attach task to a job	Yes	Yes
		API Interface to manage tasks	Yes	Yes
34	ADAPTIVE SCHEDULING	Supported?	Yes	No
35	JOB HISTORY	Supported?	Yes	Yes
36	MAIL NOTIFICATIONS	Supported?	Yes	Yes
37	SUSPEND/RESUME JOB	Supported?	No	Yes
38	OS PROVISIONING	Supported?	Yes	Yes
39	INTERACTIVE JOBS	Supported?	No	Yes
40	OVERRIDE SCHEDULING	Supported?	Yes	Yes
		Via filters	Yes	Yes
		Run Job manually, immediately	No	Yes
		Hold a running job manually	No	Yes
		Change Formula on the fly	No	Yes
Dedicated time	No	Yes		
41	ADMIN GUI	Supported?	Yes	Beta
42	CLI	Supported?	Yes	Yes
		DOS	Yes	Yes
		Power Shell	Yes	No
43	INSTALLATION, CONFIGURATION	Supported?	Yes	Yes
		Silent Installation	Yes	Yes
		Automatic Installation	Yes	Yes
		Migration Upgrade	Yes	Yes
		Ease of Installation and Configuration	Cumbersome	Easy
44	COST	Price	Free Software	Charged Nominal per core, High volumes negotiable
		OS Licences	OS Server licenses required	OS Desktop and Server licences supported
		OEM Support	No OEM support available	Professional OEM support provided

SUMMARY - PBS PROFESSIONAL

PBS Professional is an excellent solution as a job management system for Windows and Linux platforms.

PBS PROFESSIONAL PROVIDES:

- Ease of use
- Efficient and adaptable job scheduling on large clusters, supercomputers and cloud based systems
- Full technical support

PBS Professional can be installed on existing Windows and Linux HPC Clusters and replace legacy job management systems, with a modern fully supported system.

