

A Power BI Cheat Sheet – demystifying its concepts, variants and licencing

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Power BI has truly evolved over the past few years. From an add-on in Excel to a truly organisation wide BI platform, capable of scaling to meet the demands of large organisations; both in terms of data volumes and the number of users. Power BI now has multiple flavours and a much more complicated licencing model. So, in this article we demystify this complexity by describing each flavour of Power BI and their associated pricing. We summarise it all at the end with some scenarios and in a single **cheat sheet** for you to use.

Desktop, Cloud, On-premise, Pro, Premium, Embedded – what does all of this mean?

I thought it best to separate the “why” (i.e. why do you use Power BI – Development or Consumption), the “what” (i.e. what can you do given your licence variant), and the “how much” (i.e. how much is it going to cost you) as combining these concepts often leads to confusion as there isn’t necessarily an easy map between why, what and how much.

Let’s first look at the “why”

“Why” deals with the workload performed with Power BI based on its deployment – i.e. **why** do you use Power BI? Is it for Development or for Consumption. This is very much related to the deployment platform (i.e. Desktop, Cloud, On Premise or Embedded).

The term “consumption” for the purpose of this article could range from a narrow meaning (i.e. the consumption of Power BI content only), to a broad meaning (i.e. consumption of-, collaboration over-, and management of Power BI content – I refer to this as “self-serve creators”).

Deployment	Description	Workload	Variants
Desktop	Desktop is a developer’s technology. Used by someone skilled in Power BI to access data, enhanced data through a plethora of transformations, model the data into semantic models that a business user can understand, and create visual reports if he/she wishes to do so. Desktop files can be shared via email, but it is not suggested to do so for production use as it breaks pretty much every governance convention out there. Desktop files must be deployed to the Cloud, or to the On-premise environment for Production purposes.	Development	<ul style="list-style-type: none"> Power BI Desktop
Cloud	Powerbi.com Power BI models, reports and dashboards are hosted in the cloud. Users have access to a free licence for personal BI, or for corporate solutions as a Pro, or a Premium user.	Consumption	<ul style="list-style-type: none"> Power BI Free Power BI Pro Power BI Premium
On premise	Power BI reports hosted on an on-premise server. Users have accessed through SQL Server Enterprise (with Software Assurance) or Premium licencing.	Consumption	<ul style="list-style-type: none"> Power BI Report Server
Embedded	Integration of Power BI content into apps and is a broader Azure concept priced per hour based on cores, RAM and page renders.	Consumption	<ul style="list-style-type: none"> Power BI Embedded

Why – workload/ deployment matrix

Now let’s overlay the “why” with “what”

In the table above, I not only dealt with the “why”, but I also introduced the variants of Power BI; namely Desktop, Free, Pro, On Premise and Embedded. Variants are related to the licence under which the user operates and it determines **what** a user can do.

Confused? Stay with me...all will become clearer.

Variants	Description	Deployment	Licencing regime
Power BI Desktop	Appropriate for users that develop business focussed data models (semantic models), and visual content if required. Visual content can also be created in a Cloud Deployment.	Cloud On premise Embedded	Per user licence
Power BI Free	Appropriate for personal BI only as users with free licences cannot share, nor take part in shared Power BI Content.	Free, Pro and Premium are the licencing arrangements under which Desktop contents are consumed if deployed to the Cloud	Per user licence
Power BI Pro	Create visual content (self-serve) from semantic models or many other data services included in powerbi.com. Share contents and take part in shared content.		Per user licence
Power BI Premium	Consumption of shared content only. No self-service capabilities.		Capacity based licencing
Power BI Report Server	Consumption of shared content only. There is limited self-service capabilities when used in conjunction with Desktop.	Report Server refers to the on-premise environment to which Desktop contents can be deployed	Included in Premium, or in SQL Enterprise (with software assurance) licencing
Power BI Embedded	Integration of Power BI content into apps and is a broader Azure concept proceed per hour based on cores, RAM and page renders.	Embedded refers to the integration of content deployed to the Cloud and managed by a Pro user and Azure App Workspaces	Node based licencing

What – deployment/ licence variant matrix

Lastly let’s look at the “how much”

The Power BI journey (mostly) starts with development in Desktop, then proceeds to a deployed environment where it is consumed (with or without self-serve). Let’s close the loop on understanding the flavours of Power BI by looking at what this means from a licencing cost perspective.

Disclaimer: The pricing supplied in the following table is based on US-, Australian-, New Zealand- and Hong Kong Dollars. These \$ values are by no means quotes, but merely taken from the various calculators and pricing references supplied by Microsoft as at the date of first publication of this article.

Variants	Licencing Regime	Licence costs
Desktop	Free	USD - \$0 per user AUD - \$0 per user NZD - \$0 per user HKD - \$0 per user
Free	Free	USD - \$0 per user AUD - \$0 per user NZD - \$0 per user HKD - \$0 per user
Pro	Per user licence	USD - \$9.99 per user AUD - \$12.70 per user NZD - \$14.90 per user HKD - \$78.00 per user
Premium	Capacity based licencing	USD - \$4,995 per node pm AUD - \$6,350 per node pm NZD - \$7,450 per node pm HKD - \$39,000 per node pm
On premise	Included in Premium, or in SQL Enterprise (with software assurance) licencing	USD - \$14,256 per 2 core pack For software assurance and currency-based pricing please contact your licencing provider
Embedded**	Node based licencing	USD - \$735 per node pm AUD - \$937 per node pm NZD - \$1,015 per node pm HKD - \$5,710 per node pm

How much – licence variant/ cost matrix

<https://www.microsoft.com/en-us/sql-server/sql-server-2017-pricing>

<https://powerbi.microsoft.com/en-us/calculator/>

<https://azure.microsoft.com/en-us/pricing/calculator/>

****Other ways to embed Power BI content are via Rest API's (authenticated), SharePoint online (via Pro li-cencing) and Publish to Web (unauthenticated), but that is a level of detail for another day. For the purpose of this article we focus on Power BI Embedded as the only embedded option.**

Pro is pervasive

Even if you deploy to the Cloud and intend to make content available to pure consumers of the content only (non self-serve users), whether it be in PowerBi.com or as embedded visuals, you will still need at least one Pro licence to manage your content. The more visual content creators (self-server creators) you have, the more Pro licences you will need. But, it is worth considering the mix between Pro and Premium licences, as both Pro and Premium users can consume shared content, but only Pro users can create shared content (via self-service), so the mix must be determined by a cost vs capacity ratio (as discussed below).

A little bit more about Premium

Premium allows users to consume shared content only. It does not allow for any self-service capabilities. Premium licences are not per user, but instead, based according to planned capacity, so you pay for a dedicated node to serve your users. Consider Premium licencing for organisations with large numbers of consumers (non self-serve) that also require dedicated compute to handle capacity. The organisation would still require one or more Pro licences for content management and any self-serve workload.

Premium licencing is scaled as Premium 1, 2 or 3 dependant on the number of users and required capacity. You can scale up your capacity by adding more nodes as P1, P2 or P3, or scale up from P1 to P2, and from P2 to P3.

Premium Capacity Levels	Total Cores	Front end Cores	Back-end Cores
Power BI Premium P1	8 v-cores	4 cores	4 cores, 25 GB RAM
Power BI Premium P2	16 v-cores	8 cores	8 cores, 50 GB RAM
Power BI Premium P3	32 v-cores	16 cores	16 cores, 100 GB RAM

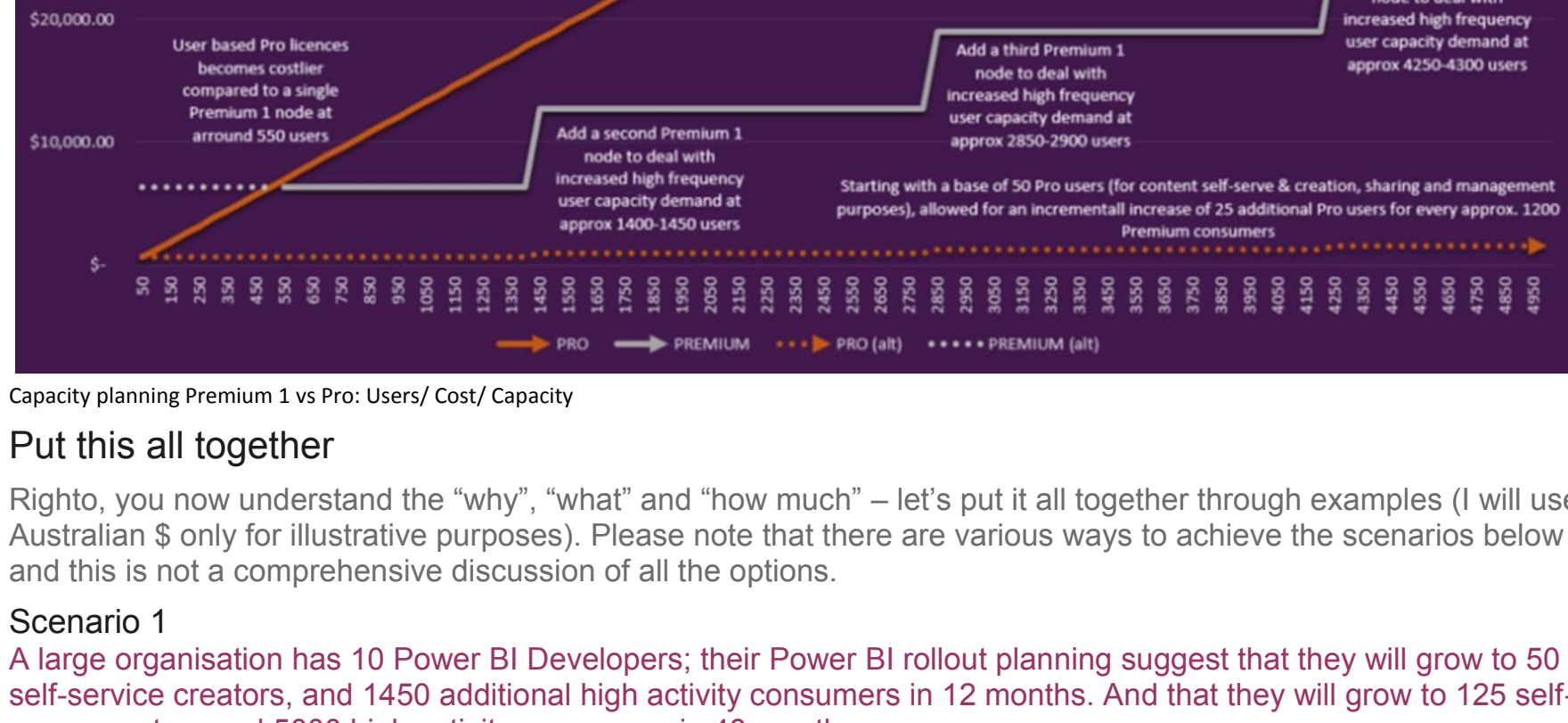
Premium capacity levels

Mix between Pro and Premium

Given that Pro users can do more than Premium users, and given that you will need to buy one or more Pro licences anyway, why would you not only use Pro rather than Premium? There are two reasons:

- There is a tipping point where Pro becomes more expensive compared to Premium, and
- With Pro licences you use a shared pool of Azure resources, so is not as performant as Premium which use dedicated resources, so there is a second tipping point where your capacity requirements won’t be sufficiently served by Pro.

The diagram below shows the user and capacity tipping points (discussed further in scenario 1 below):



Capacity planning Premium 1 vs Pro: Users/ Cost/ Capacity

Put this all together

Righto, you now understand the “why”, “what” and “how much” – let’s put it all together through examples (I will use Australian \$ only for illustrative purposes). Please note that there are various ways to achieve the scenarios below and this is not a comprehensive discussion of all the options.

Scenario 1

A large organisation has 10 Power BI Developers; their Power BI rollout planning suggest that they will grow to 50 self-service creators, and 1450 additional high activity consumers in 12 months. And that they will grow to 125 self-serve creators and 5000 high activity consumers in 48 months:

Initially they will require

10 x Power BI Desktop licences = \$0 x 10 = \$0

500 x Power BI Pro licences to cover both self-serve users and consumers = \$12.70 x 500 = \$6,350

Total – A\$6,350.00pm

Once they exceed 500 they can revert to

50 x Power BI Pro licences to cover self-serve users = \$12.70 x 50 = \$635

1 x P1 node to cover the next tranche of high activity consumers = \$6,350

Total – A\$6,985.00pm

Thereafter

Add Power BI Pro licences as required up to their planned 125 = \$12.70 x 125 = \$1,588

Add 1 additional P1 node at 1,450 users, and again at 2,900 users, and again at 4,250 users = \$25,400 for 4 x P1 nodes

Total after 4 years at 5000 high activity consumers and 125 self-serve creators – A\$26,988.00pm

Scenario 2

A small organisation with 1 Power BI developer, 5 additional self-service creators and 10 additional consumers of visual content, with no custom applications/ websites.

1 x Free version of Power BI Desktop: 1 x \$0

15 x Pro licences as both visual creators and mere consumers will take part in shared content: 15 x \$12.70

Total – A\$190.50pm

Scenario 3

A small ISV organisation with 3 Power BI developers want to embed Power BI content in an application that they sell. The application must be up 24 x 7 and do not require a very high volume of concurrent use, but licencing cannot be on a per user basis.

3 x Free version of Power BI Desktop: 3 x \$0

1 x Pro licences acting as the mater of the Shared content: 1 x \$12.70

A1 Node pricing: 1 x \$937

Total – A\$950.00pm

Scenario 4

A medium sized organisation with 5 Power BI developers want to embed Power BI content in an internal portal such as SharePoint which is used by potentially 250 users. They also have 10 self-service creators, and 25 consumers of Power BI content through the Power BI portal.

5 x Free version of Power BI Desktop: 3 x \$0

26 x Pro licences acting as 1 master of the Shared content and 25 consumers: 26 x \$330.20

A1 Node pricing: 1 x \$937

Total – A\$1,267.20pm

Power BI – licence variant, workload, deployment & cost cheat sheet

Any process shown in Australian \$

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Variants	Workload	Purpose	Environment	Cost
Power BI Desktop	Development	Develop Power BI models (and visuals if required)	Power BI Desktop	Free
Power BI Free	Consumption	Personal BI only, no sharing or collaboration	PowerBi.com	Free
Power BI Pro	Consumption	Power BI content consumption, and Power BI self-serve content creation, sharing and collaboration	PowerBi.com	A\$12.70 per user per month
Power BI Premium	Consumption	Power BI content consumption	PowerBi.com	A\$6.350 per P1 note per month (serves approx. 1,450 high activity users, then scale up)
Power BI Report Server	Consumption	Power BI content consumption	Power BI Report Server	Included in Power BI Premium subscription, and in SQL Server Enterprise with software assurance
Power BI Embedded	Consumption	Power BI content consumption	Own apps and websites	Starts with A\$937 per node pm (scale up to higher nodes as required)

Licence variant, workload, deployment & cost cheat sheet

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