WEEK 4, UNIT 1

00:00:10   Hello and welcome to Week 4, Unit 1, Common Planning Model Based on Integrated Planning.

00:00:18   Today we are going to introduce you to BW integrated planning, which is a planning solution integrated with BW, that's where the name comes from.

00:00:28   We will show how this planning functionality has been optimized for HANA over time in different steps, and we will give you a system demonstration

00:00:37   showing a planning scenario end-to-end from the data provisioning side through all of the modeling, the planning artifacts, to the front end side.

00:00:49   The BW IP model is really an in-built infrastructure within SAP BW as a data warehouse, to build and to create planning scenarios.

00:01:01   This is really also a strength that we have here. A solution combining the data warehousing tasks for reporting and tool in-built, delivered

00:01:11   with SAP BW to create the planning part, because typically what customers are doing or what the benefit is, is that you can do your daily reporting,

00:01:21   your as-is data, and combine it to have a comparison with your plan data, and then to plan data accordingly. And this is the strength of IP.

00:01:32   This covers really a wide range of scenarios. This could be also used, the whole infrastructure or technology, for simple data entry scenarios, or it could even be forecast and simulations.

00:01:45   So the central modeling entry and modeling tool for the whole planning area is the so-called Planning Modeler,

00:01:54   which is a transaction that you can start in the back end starting from RSA1. On the right hand side you see the necessary artifacts which are required for a planning scenario.

00:02:06   So it starts with the data provisioning basically on the lower part, where we have a basic cube containing the actual data.

00:02:14   A real-time cube which is write-enabled, which has an open request for the plan data and a MutliProvider

00:02:23   on top of this which combines both data for the planning view.

00:02:29   This could also be in the latest technology with BW 7.4 SP8. It could also be a CompositeProvider, which is now also planning-enabled,

00:02:38   or it could be on the lower level also the advanced DataStore object for data persistence management. And then if you go up

00:02:48   in the higher level of the planning scenario here, we are creating a so-called aggregation level. And the aggregation level is really a data slice

00:02:57   coming from the MultiProvider in our system demonstration later, and based on this specific data slice or aggregation level,

00:03:06	we are doing our planning steps. So for example, you would like to have the data by month in your cubes
00:03:14	and your planning is being done on year. And then you can work on this aggregation level and do a planning on year,
00:03:23	and then a redistribute, for example, by certain characteristics or to the lower levels.
00:03:30	This is exactly why this aggregation level is necessary. On top of this you define a query, an input-ready query,
00:03:38	which you can then reuse in the front end to really build the final part of the front end part of the planning solution
00:03:47	At the front end, what you see could be Analysis for Microsoft Office, which is what we are going to use. It could also be Design Studio,
00:03:56	what we used in the BW OLAP unit already. So let's come to the pushdown history in the planning area.
00:04:05	So this is a similar story to what we've seen in the OLAP area in the respective unit. When we start on the left hand side,
00:04:13	classically with BW 7.3 on, say, any DB, all the planning functionality, all the planning functions,
00:04:21	all planning exits used to be executed on application server level. And of course, this typically leads to a high amount of, or high volume of
00:04:31	data transfer between the application server and the database. And as we saw in the OLAP units, this is something that you definitely want to avoid in order to gain performance.
00:04:41	And BW 7.3 on SAP HANA, and even more BW 7.4 on SAP HANA, has done some significant steps in that area.
00:04:49	What we are doing there is we introduced the so-called Planning Applications Kit, and this Planning Applications Kit, or for short PAK, is really the enabler for the pushdown mechanism.
00:05:00	That means as soon as the SAP BW IP application runs on SAP HANA we can enable this PAK support,
00:05:10	and as soon as we switch this on, we push down the functionalities. And you see with BW 7.4, we even increase this
00:05:18	but logically it's the same and from a usage perspective this means that if a customer has already this integrated planning model in place,
00:05:28	there is no change at the application, this is happening in the background. So let's look at a concrete example here of what really pushdown means for planning.
00:05:38	On the left hand side on the upper area you see a typical planning scenario like the one you mentioned: You are planning on the year level,
00:05:44	and on country level. So we see the actuals for 2014 on the left hand side and the plan values for 2015 in the right column.
00:05:53	And during the planning process we increase the plan value for Germany in 2015 by 50 euros.
00:06:03	Now what happens in this situation is, since we are keeping the actual data on a finer granularity, namely on a branch level,

00:06:13	and on week level, we have to distribute this value of 50 to this finer granularity.
00:06:20	Now, classically this kind of so-called disaggregation was done on the application server side, and if you do the combinatorics, you have 52 weeks and let's say 500 branches;
00:06:31	this turns out to be 26,000 combinations of characteristic values for which we have to send down a change to the database.
00:06:42	So this basically means that we have an internal table with 26,000 entries, and these 26,000 entries have to be transferred down to the database,
00:06:49	which of course is potentially a high volume and particularly if you reiterate this, it can be really very costly.
00:06:56	Now the pushdown idea here is basically to only send down the information, which value has to be disaggregated, the fact that it has to be disaggregated, and the value.
00:07:08	So basically, all we are sending down is a value of 50, and we define the granularity to which it has to be pushed down,
00:07:15	to which it has to be disaggregated, and the whole processing happens on the HANA side. And obviously there is much much less data transfer between the application server and the database
00:07:25	in this case, and therefore the whole processing is much much faster. One major strength of the BW IP model is really what we offer out of the box
00:07:35	in terms of planning functions and methods that you can already use. And you see here the selected list of what features we optimize with SAP HANA.
00:07:47	For more details we would like to refer you to the SAP Note where you can see exactly which function is in which situation being optimized.
00:07:55	But what we discussed earlier with the latest release BW 7.4 SP8, nearly all of them are really being optimized.
00:08:02	Okay, so let's come to our demo for today. We are going to show you, as you said, a planning example,
00:08:10	a planning solution end-to-end, and maybe let's start with the back-end side.
00:08:17	So we go to the Eclipse environment and start the SAP GUI in there. Let's have a look at the lower part which consists of the MultiProvider and the InfoCubes.
00:08:27	So we have a MultiProvider here as the basis for the aggregation level, as we saw earlier, and below the MultiProvider we have
00:08:36	an InfoCube for the actuals and for the plan data. And when you look at the InfoCube for the actuals, you see that its data comes from a CompositeProvider.
00:08:47	So it's one of the CompositeProviders which we used in the chapter about the HANA Analysis process, where we combined
00:08:55	the result of the cluster analysis with the sales data, and this result is now written into the basic cube for this planning scenario.
00:09:06	So we are reusing this cluster information which business partner belongs to which cluster and then create a planning scenario that we say,
00:09:16	okay, for a specific cluster I would like to do in the next year 10 or 5 or 2 percent more

	revenue. So just to remind you
00:09:26	that was the result, I think in a similar drilldown state as we showed it in the HANA Analysis Process unit.
00:09:33	With the cluster information here we have currency, and we could also drill down by business partner.
00:09:37	So that's the example which gives us the actual data. Now let's have a look at the other modeling artifacts
00:09:47	which are relevant for this example. And let's start with the aggregation level which, in the order we saw in the initial picture, comes above the MultiProvider,
00:09:57	So the aggregation level in this case is very simple. It really has the same structure as the MultiProvider. Here you see the basis InfoProvider, the MultiProvider
00:10:07	which we just saw in RSA1, and the aggregation level has all the same, exactly the same InfoObjects, the same characteristics and key figures.
00:10:18	Just one specific: This is the version, and version is the mechanism that we are using in the planning scenario to say I have a data version which is representing my actual data,
00:10:29	and then I create planned versions out of it that I can do iterations of planning steps, or maybe that many people can work on the same data.
00:10:38	Now the next step would be planning functions, that's for example the increase which I mentioned. We want to start with the actual data and then say, depending on the cluster
00:10:48	the customer belongs to, we want to increase the revenue we make with this customer in a different way. So if we look at planning functions here,
00:10:57	we've prepared one that does exactly the percentage increase. And there we are taking the net order amount in a specific version.
00:11:08	You see the plans in here, and then give it a percentage increase to say my cluster #1, 10%, #2, 5% and the third one,
00:11:18	we are not making much money with them, so we expect that they only spend a few bucks more next year, and therefore 2 percent. That's basically the basis on the back-end side.
00:11:29	Now let's look at the front-end solution which we prepared. And this is again based on a query which now looks a little bit similar
00:11:39	to the one which just showed, the drilldown status may be a little bit different. We have the cluster here and the order currency here, and the first button which we have here,
00:11:49	we have a number of buttons. The first button will copy the actual data, to the actual data here,
00:11:57	so it will create the actual version for this planning scenario. The next step would then be to take this actual version
00:12:09	and then copy it into a planned version, and we combined this step in the Fox Formula you saw already, which is running SAP HANA-optimized, and then give it
00:12:18	per cluster the increase which you've seen in the Fox Formula. So maybe now let's see an example of this aggregation. So let me filter by one currency
00:12:32	in order to make this a little bit simpler, to see the effect better. Let's take the euro. Okay.

00:12:41	So now we've restricted everything to euros and we only see the total of the clusters. And if you look at the result here over all clusters,
00:12:49	we actually want to increase the revenue from, say, roughly 1 billion to roughly 1.1 billion. And maybe, since we want to
00:12:57	have simpler numbers, let's really see what happens if we change the result here in the total line here,
00:13:06	so this line here, and see how the individual lines here for the individual clusters get adjusted. So if I enter 1.1 billion here
00:13:15	and press enter and say recalculate,
00:13:23	then the individual values get adjusted according to the formula again. Of course, the increase or the percentage
00:13:33	of how this is distributed has to follow the rules which we prescribed. Alright, and now we could even drill down by business partner to say okay,
00:13:42	now I would l like to do a business partner-specific increase, then I could drill down by business partner,
00:13:50	which would also be available in a fast manner, and then I could now overwrite what we planned to do with Becker in Berlin.
00:13:58	So that's really the planning-specific part, that you have queries where can you enter and manipulate data. If we now push the Save button we will write this data back to the plan cube,
00:14:09	and the next time we opened it, it will be appearing there, and we have a planning scenario available. Okay, so I guess it's time to wrap up what we learned today.
00:14:19	So BW comes with an integrated planning solution, which is very handy, because it really allows you to create planning applications on your corporate data.
00:14:30	It offers various planning functions out of the box, which is really a strength that it is not that difficult to create a planning scenario.
00:14:40	We offer copy, we offer distribute, we offer many functions, but again out of the box, and all of these functions are being optimized for SAP HANA usage.
00:14:56	
00:14:50	And therefore we can especially work on a large amount of data quite efficiently. So I guess that's it for this section.
00:14:59	If you wonder why we say here, it's a common planning model, it's because we will reuse this whole infrastructure with another
00:15:08	business planning consolidation solution which will be covered in the next unit.
00:15:12	But before that, don't forget your assignment.

WEEK 4, UNIT 2

00:00:14   Hello and welcome to Week 4, Unit 2, SAP Business Planning and Consolidation for SAP NetWeaver powered by SAP HANA - Embedded Model.

00:00:23   If you look back to the previous unit, there we discussed the integrated planning model. In this unit we will focus on the BPC planning model, which historically is different.

00:00:33   And we will show you how these models converge into the so-called embedded model, which brings together the best of both worlds.

00:00:40   If you know a bit about the different planning solutions based on SAP BW, you know that there was BPC coming more from the financial world.

00:00:50   And it was really providing everything you need to create a bottom-up or a top-down planning solution.

00:00:58   And this in combination with the consolidation and an own reporting solution via an own end user friendly interface and own clients.

00:01:08   This was basically where BPC was coming from. This was available in two kinds of flavors: it was a NetWeaver-based solution and a Microsoft-based solution.

00:01:18   We will here now talk about the SAP NetWeaver-based solution, because this was deployed as an own add-on in the BW.

00:01:28   Now let's compare the two approaches. The integrated planning approach and the BPC planning approach. What's the big difference from an end user perspective?

00:01:37   On the left-hand side the integrated planning approach from an end user perspective is not as flexible, it's on the other hand integrated with BW.

00:01:46   So it's really something where you need IT involvement to create the models,

00:01:53   but you have an..., you're basically working on the consolidated and typically up-to-date data of your EDW.

00:02:02   BPC end users really expected that departmental planning solution means an own environment where they can work independently mostly of...

00:02:13   independently from IT on their planning data, defining maybe even local authorizations, workflows, business flows and so on.

00:02:21   And to achieve that we took the BW data and copied it into an own environment.

00:02:29   That means we created an own name space for BPC within BW, and there we had an own BPC exclusively used InfoCube,

00:02:37   and based on this InfoCube, we then created this local departmental planning area where the different frontend tools were then consuming the data.

00:02:49   But on the frontend site we also see a split here. So we have frontends for the IP planning solution

00:02:53   and we have a different set of frontends, partially based on different technologies, for the BPC part.

00:03:00   If it comes now to the integration to the embedded model, we invested heavily in this integration.

00:03:10	That means that we rebuilt the architecture in background and built natively this BPC functionalities within the BW application functionalities.
00:03:20	So, what this really shows here is an integration of the two model approaches on both sides:
00:03:28	On the lower part, on the data side, where we basically see that the BPC embedded model is not working on a copy of BW data anymore, but it references BW data directly.
00:03:38	So, you don't have this aspect of a data silo or an outdated copy of data, but you're really working right on the BW data.
00:03:48	But still having the aspect of being able to create an own BPC environment, you see that the admin client is still... it's embedded,
00:03:56	but you can still create your own environment to achieve this departmental aspect,
00:04:02	but on the other hand having also, you see the EPM Excel add-in is now also able to consume a BW query.
00:04:11	That means you can really achieve IT-driven and -centric planning solutions and having the departmental aspects.
00:04:20	And the... we have the convergence on frontend side as well, which was split earlier. Now it's basically converged and all frontends work with the same model.
00:04:28	But, of course we have a third big player in the game, and that's obviously that we combine the BW IP, the BPC NetWeaver together on one platform, and this is SAP HANA.
00:04:42	That means we bring the best out of these three worlds together and combine them in the so-called BPC NetWeaver embedded model or BPC 10.1.
00:04:52	We have summarized here what the best of these worlds is, from our perspective. From HANA everybody knows speed is a big benefit.
00:05:00	From the IP side it's the EDW integration, as I said, you are working directly on the data in BW, not on an isolated copy anymore.
00:05:10	You have all the originals and the built-in functionality of the Integrated Planning solution
00:05:14	and you have the flexibility, the collaboration features and the user friendliness of the BPC solution.
00:05:21	So, let's have a look about the features a bit more in detail. So we spoke already about the optimization for SAP HANA,
00:05:28	means when the EPM add-in is able to consume a BW query, you of course leverage all the pushed-on functionalities we talked in the previous unit already about.
00:05:40	Means, if you consume a query including... or a planning application, including a FOX formula or whatever,
00:05:47	it will be pushed down to SAP HANA and therefore we have this enhanced capabilities for the embedded model, because they obviously are also SAP HANA- and PAK-enabled.
00:05:58	Other functionalities, which come from the BPC side: business process flows which can be configured by the department.
00:06:06	If you have a planning work flow, where individual planning steps have to be executed in a certain order or approved in between, we have functionality like data auditing,

00:06:22	which is also very important to review who actually did certain planning steps or certain changes to data.
00:06:27	We have an easy upload scenario which allows you to enrich the data which comes from BW with local data,
00:06:34	which is kind of similar to what we saw or what you are doing in a workspace for example in BW for reporting purposes.
00:06:41	And another aspect which is also very critical are authorization. So it's also possible to define authorizations on department level.
00:06:53	We would like to give you a few examples of how this is now looking like.
00:06:59	What you here see is the Web admin client where you can define all this previous discussed features.
00:07:06	So this is your solution, your application for creating the different business process flows,
00:07:11	to define these templates, the different authorizations to set up teams for the collaboration within a planning process.
00:07:20	And this is really also new within the BW IP world, that we really have now this integration and can of course leverage these features here.
00:07:30	So, you see it's really one place where you will do all the administrative part, all the modeling,
00:07:36	and all the stuff which has to be modeled from a departmental point of view here.
00:07:41	From a UI perspective you see here shortly the EPM Excel add-in which is the Excel-based frontend coming from the BPC world.
00:07:51	And you see here the UI5-based clients where we provide you in the handout materials also links to more information, to videos, and demonstrations about both in action.
00:08:08	When it comes to local data sets, we just mentioned that it is important to enrich the data from BW in certain cases with local information,
00:08:17	which you have for example in the CSV file. With this functionality of local providers we actually go a step further:
00:08:24	You can actually also create local planning scenarios which are kind of independent of BW data,
00:08:30	and you really upload the whole data set which you need for your planning applications
00:08:34	So this is additional flexibility both, for enriching data or creating your whole small planning solution individually.
00:08:41	You see this starts with a CSV file where you have a few data in there, and then you can start to build your own planning solution.
00:08:52	This is a functionality we will also further enrich but this is the... I think a very nice first step.
00:08:59	So let's sum it up what are the key takeaways. I think you have seen that we leverage really now with the embedded model the capabilities of the BW IP functions
00:09:11	together with end user friendly and enhanced functions that are coming from the BPC application and this of course natively deployed on top of SAP HANA.

00:09:22   I guess that's it for today. Don't forget your self-test, and we will see you again in Unit 3 which is about Efficient Persistency Management

WEEK 4, UNIT 3

00:00:08   Hello and welcome to Week 4, Unit 3 Efficient Persistency Management.

00:00:17   In this unit we are going to introduce the multi-temperature data management concepts which are offered by SAP HANA, and we will specifically focus on how BW leverages these concepts.

00:00:28   In particular, we will discuss the non-active data concept which has been around for a while, and a new concept which is called SAP HANA Dynamic Tiering,

00:00:36   which is new with HANA SPS9. And we will also introduce and shortly talk about SAP BW near-line storage

00:00:45   with SAP Sybase IQ, which is the focus of unit 4 this week.

00:00:51   So let's focus a bit more in detail about how SAP HANA is working. So obviously everyone is aware that SAP HANA is in-memory-based database.

00:01:04   That means, we are keeping the data in-memory all the time.

00:01:11   So that is the theory behind an in-memory database, of course. For SAP BW, it's now a bit difficult that we should

00:01:21   have the data all the time in-memory because we, as a data warehouse, we also store historic data. And therefore we are leveraging

00:01:29   a few capabilities of SAP HANA because usually there is the question of what happens if the power is going away and

00:01:37   what is happening with the in-memory database then? And the answer is we actually have a next level of persistency within SAP HANA and that's a disc-based storage.

00:01:48   So that means, really our focus is on the in-memory capabilities all the time, but of course,

00:01:56   for persistency reasons we have in the background disc space and even a Flash-based storage to store the data, so that we are not having any data

00:02:06   loss. And this is something which is interesting for SAP BW as well, because like I said the data warehouse should have the focus on historic values.

00:02:16   So we store for legal purposes, maybe for time travel, algorithms. We store the data for a company, defined by a different data retention period.

00:02:26   And therefore we introduced something which is called the multi-temperature data concept or data management. And this is a concept

00:02:35   to say hey, we have different types of data within SAP BW stored in SAP HANA and we took the multi-temperature

00:02:45   because it's somehow related to how often is the data really touched during the operations.

00:02:52   It means that we have an area in the database which contains hot data, that means we are touching, we are reading, we are writing the data every day on a highly frequent basis.

00:03:03   This data should exclusively be in-memory, which means this is hot data for us. Usually, you see it on the right hand side, the data volume is quite low.

00:03:13   This means it's daily data, it's monthly, it's weekly data but we need the best performance because this is my daily business

00:03:21	where many people are accessing it. I need the best performance there. When it comes to warm data, that's data you don't access as frequently.
00:03:28	Typical examples would be historic data, which is not used for reporting on a daily basis, but maybe once you realize that you want to create a new scenario
00:03:39	and you need historic data, you would want to leverage it. So it has to be around, it has to be accessible, and it has to be accessible in a quite fast way,
00:03:46	but not as fast as the data that you need for daily reporting purposes. And the other aspect is that this might be huge amounts of data.
00:03:54	So therefore you need an efficient storage which is reasonably cheap and can manage huge data amounts.
00:04:03	The intelligence is really now how to manage this area of data, because SAP HANA is working in a way that we keep everything in main memory
00:04:15	as long as we have enough main memory available. As soon as we do not have enough main memory available, we would start to kick data out of the main memory.
00:04:25	And this warm area is exactly to manage what data is not kept in memory; maybe even, and you will see that in two concepts, with a non-active data concept
00:04:36	we are then saying, ok this is my data which can be kicked out at first for certain objects, we will cover that, and we have the SAP HANA Dynamic Tiering
00:04:45	which is a new layer within the database a new storage area where SAP HANA can in a very intelligent and smart way, manage where the data is located.
00:04:58	So now let's come to cold data. What's cold data? Cold data is data which is really only accessed very sporadically.
00:05:05	It's not even stored in SAP HANA, which has the advantage that, for example, data lifecycle management and things like backup and recovery
00:05:14	can be handled on a completely different schedule. For this, near-line capabilities have been around with BW for quite a while,
00:05:22	and also for at least a year or so, we now have a specific solution and an optimized solution which combines SAP HANA with SAP Sybase IQ for that purpose.
00:05:33	And that's what we call the near-line storage solution. We will cover that in the next unit because this is really about information lifecycling,
00:05:42	which means we are talking there about archiving. So data which should maybe not be at all in my online database, or maybe
00:05:51	it should be near-line, that I can access it for reporting but it's not stored in my main database.
00:05:58	So maybe let's come to the rough distribution so that you get a feeling of what areas of your data warehouse fit in which of the temperature areas.
00:06:08	So what you see here is basically our reference architecture we introduced also before, where we say we have an area where we load data
00:06:18	into SAP BW, or we access it directly, this is the open operational data store layer. We have an EDW layer; this is our core layer
00:06:28	where we harmonize the data, where we consolidate the data, and we have our business-

specific architect the data mart area,

00:06:36	which has usually been the reporting layer. But you see that with SAP HANA actually, all of these layers
00:06:46	could be possibly available for reporting, beside the fact that usually the archive or the near-line search is not that high frequent available for reporting.
00:06:58	So you see on the right hand side the different areas. You see hot, warm, cold again and this is how we think usually the data is distributed in such, if you map this to our architecture.
00:07:10	So the open ODS layer, as the entry layer has, for sure, aspects of staging. This means maybe this is related also to PSA tables
00:07:19	where we definitely have a persistency, this is warm, where we do not do reporting but we touch the data for reporting. But we also have a hot area
00:07:28	because you learned the open ODS View, concepts like that, we can work on this level very close to reporting.
00:07:36	Other areas could be the corporate memory where we store the data for historic percents but not to do reporting.
00:07:43	Okay, maybe let's quickly review the non-active data concept. So the point about non-active data was we mentioned earlier that of course, SAP HANA tries
00:07:53	to keep all memory which has to be processed in the main memory. But if SAP HANA runs out of data,
00:08:02	then it has to remove certain tables or indices from the main memory. And with the non-active data concept
00:08:11	you can basically define your preference which data should be unloaded first.
00:08:15	There, so you can mark, if you do it on the native HANA side, you can basically mark tables which are removed from main memory with a higher preference,
00:08:24	and BW basically manages this automatically for you. So when you create an object you don't have to care personally about this as an end user,
00:08:32	but BW has a more or less best guess because BW knows roughly, for example, if something is a PSA table,
00:08:41	then you will not do reporting on it and therefore it should be unloaded if heavy reporting is going on in the system
00:08:48	and the PSA is probably a little bit out of focus for the moment. Then we are working there, not every time on the whole object but rather than,
00:08:57	it could even be that we load the last request into main memory but the rest of the DataStore object for instance, it's not in main memory because of this concept.
00:09:07	So by default we are flagging all PSA tables and all write-optimized DataStore objects as non-active, which means that the unload priority is high.
00:09:18	They will get moved from the main memory initially. Now usually the question is can I influence this?
00:09:27	Can I set this property on my own? The answer is, in theory you could on the database but we would not recommend this,

00:09:36	because you can imagine that this has to be managed by the database and by the application. For write-optimized DataStore objects, we usually think there should not be
00:09:44	reporting happening, and therefore this feature can be set. They are usually used as Propagator DataStore objects or corporate memory where no access
00:09:54	is happening. And that's exactly the difference between the non-active data concept where we work on partition level but it's a really a concept which fits until the main memory,
00:10:08	the concept which starts until the main memory is being fully used.
00:10:13	That's a different concept than SAP HANA Dynamic Tiering which is, associating the next level of this idea.
00:10:21	So what's the idea of SAP HANA Dynamic Tiering? It basically introduces a second storage area.
00:10:30	Another engine which handles the warm store in SAP HANA and
00:10:38	the idea is that you can place tables either in the hot store or in the warm store, and that's for the entire table in this case.
00:10:45	The reason for this is because of course you would like to reduce the in-memory footprint or to optimize it because not all PSA tables
00:10:54	have to be in the main memory, like we said, it's totally sufficient if they are stored without being, all the time, in-memory. And therefore
00:11:02	we introduced this warm store from a database perspective, this is a totally transparent process.
00:11:08	It means for this additional store we have a unified installation, one backup process, so all of the things that you would expect
00:11:19	from a closed database environment, and this is exactly what is happening there. Now, one of the differences to the non-active data concept is that
00:11:28	if you access data in the warm store, it doesn't have to be loaded into the hot store first. So, all of the executive happens inside the warm store and at most,
00:11:37	it might happen that a certain part of the result set is moved to the hot store. But like certain operations
00:11:45	which happen within the warm store will completely happen down there, and no data and no memory has to be allocated in the hot store for that.
00:11:54	With a non-active data concept, we had already an impact on sizing, but this is now really having a very nice impact on the in-memory usage.
00:12:05	And for BW, we are using that again for the write-optimized DataStore object and data sources. And we have the property to say,
00:12:14	from a BW perspective this is an extended table and this means that we are extending the storage of SAP BW within SAP HANA and moving this whole object,
00:12:23	which means the whole write-optimized data object with all the data included to this warm store area. And this is fully transparent for all processes within SAP BW.
00:12:33	There is no change at all beside one small flag. That means data loading, reading, whatever you are doing with the object, it's fully transparent.

00:12:44	It's just that we have one property, and then we really manage where we store the object.
00:12:51	Alright, so I guess we can have a look in the system again.
00:12:59	So here we go. This is a DataStore object, which in our scenario could be a corporate memory in a data flow dealing with the EPM model of course.
00:13:11	So let's open this and let me show you where you can find the settings which we are talking about. So if you open the settings part here,
00:13:20	and maybe let's enlarge that a little bit, you see that this write-optimized DataStore object now has a specific setting called extended table,
00:13:31	which basically specifies whether the table should be created in the hot store or in the warm store.
00:13:38	In this case, we checked the flag, and that's everything you have to do. For data sources and PSAs it's similar, you also find a checkbox there,
00:13:46	which allows you to specify this PSA table should be generated in warm store. Since we are working here also with a columnar-based engine
00:13:56	and managed by SAP HANA, we have also a reporting performance which is actually very nice. So we do not have a big performance loss between hot and warm,
00:14:09	however, for sure the hot one is really where the performance, the best performance is being offered and for high frequent operations,
00:14:16	definitely it should be the entry point. And if you see this here in our example; so we have this for the DataStore object,
00:14:26	but we also use this for the PSA table underneath, so this is exactly our scenario.
00:14:32	We have a PSA table, we are writing 2 DataStore objects. One is our central reporting DataStore object,
00:14:38	and the other one is our corporate memory, and there you see also that the PSA also has this property, PSA as extended table.
00:14:46	And by having this flag set, everything is done and we move in the background from the hot store to the warm store.
00:14:52	In future, at this point in time, we are also planning to offer this conversion on the fly, for existing objects,
00:15:01	you can do this. In our scenario here, we first created the object, marked it and loaded it with data.
00:15:10	Yeah, I guess that's it in the system. You might now also ask yourself is this the same as near-line search?
00:15:17	Are we now still doing archiving and near-line storage? And the answer is actually given in the next unit, but let's sum it up.
00:15:25	Yes, actually my answer would have been why would they introduce another unit if it were the same, right?
00:15:31	So what were the key takeaways here? So, with SAP HANA we have a very strong in-memory database, but

00:15:39	SAP BW as a data warehouse has to manage the data very smart or even the database has to learn it within the latest innovations
00:15:49	there, because we have different object types like a PSA, like a write-optimized table, where we would like to manage where the data to which point in time is located.
00:16:00	Both concepts, we introduced the non-active data concept and the extended table storage concept, or flag in our case,
00:16:10	helped to improve the way that we manage warm data. The non-active data concept is set by default,
00:16:18	the extended table or the SAP HANA Dynamic Tiering, which is the corresponding feature on the database level, is an optional feature,
00:16:25	and they should be used depending on what the object is doing or which service it is fulfilling depending on the architecture.
00:16:35	I guess that's it for today and the discussion will start in the next unit with what exactly is the difference between
00:16:44	this concept and the near-line storage concept? And don't forget to do your Assignment.

00:00:08   Hello and welcome to Week 4, Unit 4, Information Lifecycle Management.

00:00:18   In this unit we want to focus on the near-line storage capabilities of SAP BW in combination with SAP IQ,

00:00:26   and we want to compare these near-line capabilities with the SAP HANA Dynamic Tiering concept, which we talked about in the last unit.

00:00:36   So let's talk a little bit about near-line storage in general.

00:00:41   You are probably aware of the fact that a near-line solution has been around with SAP BW for quite a long time.

00:00:47   There has been a near-line interface for many years, which usually was implemented by partners earlier, and there were different solutions with different hardware

00:00:57   for the near-line data provided by partner companies. So what we offer now here is SAP-owned near-line storage interface

00:01:08   in combination with SAP IQ as a database, and this goes along with the data aging strategy.

00:01:14   That means we talked previously in our Data Temperature unit about hot, warm, and cold data, and for the cold data,

00:01:22   where we do not expect a change anymore, this is something that should not be kept in the your online, in your primary database,

00:01:32   especially with SAP HANA in the hot area, and therefore we staged this data out of SAP BW in an own-standing environment which is SAP IQ.

00:01:43   This is also a columnar database which runs on commodity hardware, so it's not the same SAP HANA Appliance,

00:01:51   therefore it's very cheap from the hardware perspective. And then we stage data from existing InfoCubes,

00:01:59   DataStore objects, for instance, towards this SAP IQ. And you are doing that by creating, for instance, time slices to say this is my InfoProvider

00:02:11   containing the last 5 years of data, and maybe I take the last, I don't know, 4 years and stage this out because I do not need it in a frequent access anymore. And this

00:02:20   is the difference between the near-line storage and the archive solution. So near-line storage, it's not online, it's near-line,

00:02:28   and near-line means you can still access it from the application. So during runtime, if the data which is stored in the near-line storage

00:02:38   solution is being queried, the BW OLAP Manager can handle and redirect this query statement instead of the primary database towards SAP IQ.

00:02:49   So it's not only available for query purposes, it's actually also available for query purposes in an optimized way. So we take a lot of care

00:02:57   that we can access data in SAP IQ in a very fast manner, and we also try to leverage as much as possible the pushdown capabilities of SAP HANA in that case.

00:03:09   Now, what's the big reason behind near-line solutions? Why do you want to phase-out data

into a second persistency?

00:03:16	As you said, we typically do this with data which doesn't change anymore. Historic data which is maybe at least one or two years old,
00:03:23	depending on the application. If you don't have any updates on this data anymore, then it is basically possible to put this into an external database,
00:03:30	SAP IQ in this case, and the point is that unlike the online database, you can then have completely different schedules for backup and recovery
00:03:39	on the near-line side, because data doesn't change anymore. So basically only after archiving additional data or bringing additional data into the near-line,
00:03:49	you have to do a backup and then you are basically done. So this is typically what happens once a month or maybe even once a quarter. And this is something we recommend in general,
00:03:57	every customer to have an idea about data aging, information lifecycling because it is of course critical how big your primary database is,
00:04:06	no matter which kind of database you're using, because the larger database system, the more data you are storing there.
00:04:13	This will also enlarge and make your backup, your disaster recovery, all these times, it will make definitely make them longer, and
00:04:24	a slim database is definitely not a disadvantage, and therefore near-line storage is really the solution. It's an own-standing solution to phase-out the data.
00:04:32	It is fully integrated in the ETA capabilities for reporting and even for the, we talked about the HANA view generation,
00:04:40	even reporting in an SAP HANA view generated by BW on a certain InfoProvider can be redirected via our interface to SAP IQ.
00:04:51	So here is the comparison between SAP HANA Dynamic Tiering on the one hand side and near-line storage on the other side.
00:04:59	We mentioned if you learned about these concepts you might think hey, are they not really similar or even the same? And our answer here is really no.
00:05:10	They are not. So SAP HANA Dynamic Tiering is a concept within the online primary database. So it's an important part of the whole platform,
00:05:21	of the whole database, whereby a near-line storage solution is an additional server next to your online database, and therefore you have, like you said, different
00:05:30	service agreements based on this storage compared to your primary database.
00:05:36	Also from a TCO perspective, near-line storage plays a different role than the online database, obviously.
00:05:44	From a data access perspective, a near-line search is, in our case, it's a locked area,
00:05:50	which means as soon as data has been archived into the near-line storage solution, the data is locked for updates, because we typically expect that this data is not changing anymore
00:06:01	and therefore it's been frozen, it's cold in the near-line storage solution. SAP HANA Dynamic Tiering is for the InfoProvider that we talked about, PSA tables, write-optimized DataStore object,

00:06:12	is offering the full set of operations. So any reads, deletes, updates; everything
00:06:22	is really possible based on the tables stored in the warm store of SAP HANA.
00:06:27	The last points we are mentioning here is that as you've seen earlier, SAP HANA Dynamic Tiering basically deals with the complete table,
00:06:36	either a complete table is stored in the warm area or in the hot area, whereas with near-line storage you can basically define a certain time slice, for example,
00:06:45	of data or any kind of slice of your data and bring this data into an external near-line storage.
00:06:53	The good point is from a performance perspective, both offer a really good performance because, remember, the SAP HANA Smart Data Access technology
00:07:03	that we talked also about in our Data Provisioning week, this is being leveraged as access interface for near-line storage, so you will see that in our system demonstration
00:07:12	that also the reading performance towards the near-line storage is really really good, also for a large amount of data because
00:07:22	SAP IQ shares the same columnar and paradigm as SAP HANA, and therefore it's definitely a good access time.
00:07:32	Now we are coming to the demo let's see how this looks in the system. Again we are opening the Eclipse environment and inside Eclipse
00:07:42	we are going to RSA1. So here we have an example of a data flow which contains an object which has part of it's data archived.
00:07:52	How can we see this? You go to the Manage tab of this DataStore object. In the Manage tab you actually see, well, first of all you see that we have loaded some data
00:08:01	into this DataStore object, and if you go the Archiving tab, you actually see what part of the data has been brought into the near-line archive.
00:08:10	And what is now also one important part of the near-line storage solution and this is really that we offer via this interface
00:08:20	a consistent process. That means, we are ensuring that during copying the data towards SAP IQ and the verification phase,
00:08:30	the deletion of the data, this is consolidated; it's one transparent process, so we are making sure that the data is not changed,
00:08:40	being deleted, or that there is any data loss. So it means that there will be verifications points and as soon as the data is not written in through SAP IQ
00:08:48	we are not deleting, and so on. But it is definitely the case that we are moving the data from this InfoProvider you are seeing here for a specific condition:
00:08:57	in our case, 2009 to 2010. I think we even have data for 2014.
00:09:05	You'll see that in the query. So for this data, for this time slice we have now archived around 3.2 million records
00:09:15	towards SAP IQ. And the object that you are using for that it's an own archive process, so if you go to the object you see here,
00:09:27	Data Archiving Process, and you can now display. So this is here something like a DTP just for

archiving,

00:09:35	where you can say it could either be ADK-based, which then means it's not near-line it indicates our traditional archiving solution out of the system into a file.
00:09:45	Or you can use this near-line connection and then you can maintain how you would like to slice or to select the data for archiving,
00:09:55	which could be time sliced-based, it could be a request, it could even be a free selection, which means you do it here via, I don't know, by country or something like that,
00:10:04	if that makes sense. And in our case we did it for time slice, so we took the year and moved the data for two specific years towards SAP IQ.
00:10:15	Okay, so let's see what happens if you run a query on this. Again we are in Microsoft Excel-based Analysis for Office.
00:10:26	We select an already created query which has to say it's order and the year as information. You see that, and
00:10:36	now it's pretty boring, so there is no big magic happening through SAP IQ, but what happened in the background
00:10:45	is that we actually had two reading jobs running: One was going through SAP HANA fetching the data for 2014,
00:10:53	and the other one was directed to SAP IQ and fetching the year 2009 and 2010 from there.
00:11:02	And if you are now afraid about reporting performance, we can even do a drilldown by, I don't know,
00:11:11	by business partner, which is the most granular object, and you see there is not much performance impact recognizable in this case.
00:11:21	And like we said previously, even some OLAP operations like some types of aggregations are aligned
00:11:30	and optimized in combination with SAP IQ, so also our pushdown logic is also working there.
00:11:37	So let's wrap up what we discussed in this section in this unit. What's the point of near-line storage?
00:11:47	The idea behind it is to reduce the amount of online data in your database and the main purpose of this is again, if you have data which is not changing anymore,
00:11:56	it's not worth the TCO of constant backuping and so on.
00:12:01	This is the difference to the SAP HANA Dynamic Tiering concept, where the data is still sitting in your online, in your primary database,
00:12:12	but there in a different store type operated with a different SAP HANA engine. But the data is still there
00:12:20	available for backup and everything, so if you really have a large data warehouse installation, archiving information, lifecycling is a really important part.
00:12:31	You should first of all have a data retention period defined, and based on this, you should then move data to an archive
00:12:40	or even to a near-line storage if there might still be some reporting necessary for some

purposes or whatever.

00:12:48   And this is really the different aspects of both solutions, whereby also Dynamic Tiering, we see that more in the warm area, that means for corporate memory objects

00:12:59   or different kinds whereby the near-line storage is really for the frozen cold data which is not changed in any time.

00:13:11   I think the good point is that also SAP HANA and IQ share the same columnar paradigms, so the reporting performance also with

00:13:21   the near-line storage is quite good, and with that I guess you are ready for the Assignment and we are basically getting ready for Unit 5.

WEEK 4, UNIT 5

00:00:09   Hello and welcome to Week 4, Unit 5, Installation and Migration Options for SAP BW powered by SAP HANA.

00:00:20   It's week 4, Unit 5 so we are basically close to the end of this course, and you've seen a lot of new functionality which is available

00:00:29   with BW exclusively on HANA. And so when we thought about the structure of this course we figured that by now you probably, if you're not on HANA already,

00:00:38   in an extremely frustrating situation now. You maybe have access to a system, a BW system running on any DB, but you can't use any of the functionality which we are showing here.

00:00:49   So we also thought it is just fair from our side to provide you with the information on how to get into the HANA world.

00:00:55   This will cover the different migration options and tools that you should know in front of a migration.

00:01:02   Basically there are two different main categories of project approaches towards SAP BW powered by HANA.

00:01:11   This could be an new installation, which means you are starting from scratch with a brand new installation, or you migrate an existing installation.

00:01:19   In the new installation case, we see that of course when a customer starts with the fresh new BW

00:01:28   implementation where no BW is in place, so this is obviously the way to go. We've also seen that, at customers with the existing BW on any DB system,

00:01:41   we had many bottlenecks or modeling things which are not that nice, so this is typically also an approach

00:01:50   where you can say OK, I run now two systems in parallel for a transition period. I'll start with a brand new one and transport maybe some existing scenarios,

00:01:59   some master data objects into this new landscape and then I deploy both in parallel by loading the data twice in these two systems. But then after a time,

00:02:09   I switch the existing one off, because then my greenfield implementation is done and offers the same, of course, more information, than the original system.

00:02:17   Now on the other hand you might have a system which is fine from an architecture point of view and you just want to leverage the new functionalities

00:02:25   provided by SAP BW on SAP HANA on top of this. And for this, we have two migration options which allow you to bring your existing system into the HANA world.

00:02:34   The first option is an in-place migration which basically requires only one system which is first upgraded and then migrated to HANA.

00:02:43   The upgrade is basically necessary to bring you to a BW release which is HANA-enabled and which supports HANA,

00:02:52   and of course the migration is necessary to do the transition from any DB to HANA.

00:02:57   As a recommendation from our side, I mean in theory, we started with 7.3 SP5, but of course we would now really recommend

00:03:07	to go with SAP BW 7.4 SP8 and SAP HANA as the choice for the in-place migration.
00:03:17	The next option would also be to say okay, I would not like to work on one system, on one database which is done in in-place migration.
00:03:26	I'm copying now my existing system in a redundant manner so I have two systems
00:03:32	and I have two BWs on any DB, and now I'm starting to upgrade in order to migrate my redundant system towards SAP HANA,
00:03:43	because I would like to have a risk free approach, to have a redundant backup of my system.
00:03:50	But this is of course also aligned with a lot of effort, because you have to maintain two systems, and this should also not be done in a long period.
00:03:59	We've seen usually this in proof of concepts in the early times with SAP HANA, but in the meantime I think most of our customers
00:04:09	really choose the in-place or the greenfield approach. So now let's have a look at the details of these migration approaches a little bit more closely.
00:04:20	The in-place migration is basically looking like that, so you are already on 7.4 or not.
00:04:27	So you have to do first an upgrade of your existing BW system and then you do a database migration towards SAP HANA. All this is happening in one single instance,
00:04:39	so you are also using the same system ID and so on, and then afterwards you are finally there on the latest release powered by SAP HANA.
00:04:47	The other approach which we also showed you in the previous slide is that you create a copy of your system first,
00:04:55	so you do a database copy, still running on any DB after the copy obviously, which also, by the way, provides you with the option to move this copy into the Cloud
00:05:07	for example, the HANA Enterprise Cloud. Right, so this is the way, like I mentioned to compare maybe even a BW on HANA system with a
00:05:17	non-HANA system, or you move to the Cloud, and then you could of course then in the Cloud or on-premise, wherever you are, follow an upgrade
00:05:26	and a migration. But this would be the old way. The new way, and this is really a new possibility, is the so-called
00:05:35	direct migration option, and this is a combination of the upgrade and the migration in one single consistent step.
00:05:43	So we are taking an existing BW on any DB system, upgraded to a certain release,
00:05:50	and then also switch the database. That means the existing database remains untouched during that transition period, and we really
00:05:59	lower down the system downtime. And this approach is also available directly without doing a system copy or database copy first.
00:06:08	So let's have a closer look at the tools involved in these processes. So we have many traditional tools here.
00:06:17	So the software provisioning manager is there since quite a while, I think since NetWeaver 7.3. This is the main tool to do the copy and the migration tasks.

00:06:28	And we have a new tool here, you see the DMO, the Direct Migration Option, which is like I said a combination of upgrade migration and even a Unicode conversion.
00:06:39	So all this can happen in one step. Beside that, you'll see the Software Update Manager on the left hand side, which is the tool
00:06:47	to update BW releases. And you see an abbreviation here, PCA. And that's a very interesting tool
00:06:55	which is the post-copy automation tool, which helps you with a lot of predefined templates and task lists to run certain steps
00:07:04	which are necessary after a system copy in the system. So for example, you have to handle the source-dependent objects or do a lot of Basis-related steps,
00:07:15	and this is a tool where we have, for especially this copy case, automated a lot of things.
00:07:20	So I guess the two points which are really most relevant on this slide are the direct migration option. Again, I think you said it already,
00:07:29	it does upgrade migration and even Unicode conversion in one step. And the additional value of the post-copy automation,
00:07:38	which is really useful when it comes to do all the after-work which is necessary to get your system copy in a consistent shape.
00:07:47	We do not have now, unfortunately, enough time to cover all of them, but you will find a lot of information published in the SAP Network.
00:07:57	In the Help you will find a lot of information. This is just a small collection: You will also find in the handout material more links to the different options.
00:08:08	Then there is one tool which is also very important in both the pre-migration phase
00:08:18	and post migration phase when you are already running on HANA, that's the BW migration cockpit. This is something we brought up after some time,
00:08:27	after experiencing a lot of different migrations and implementation projects and the tool really combines a lot of
00:08:37	the different tasks and is a unified entry point for a lot of different other tools. So for instance, you will find there
00:08:45	a link to the different sizing reports for BW and HANA. You will find a checklist tool which is checking all of the systems parameters to say ok,
00:08:54	I have now the right kernel information, SAP Notes implemented, that I can start an installation or a migration project.
00:09:03	Furthermore, it will also in front of a migration check the technical things that will link you to certain housekeeping tasks
00:09:12	and even, if you are already on SAP HANA, it will give you a lot of beneficial information, like I said,
00:09:19	housekeeping because obviously this is also relevant within the SAP HANA landscape.
00:09:26	So what are the golden rules and the most important things that you should have in mind when you go on the HANA route.

00:09:33	Sizing, sizing, sizing, definitely sizing is one of the most important tasks in front of a migration because, like we discussed in the previous units,
00:09:45	we have to ensure that all of the data is fitting into the main memory, and therefore we have to check everything which is in an existing SAP BW system,
00:09:54	and then we will size the different object types specifically towards SAP HANA,
00:10:00	because we will definitely have a compression factor and we consider this. For new BW and HANA installations,
00:10:07	we have the Quick Sizer tool available where you can exactly define what is your target architecture and then it will also give you a sizing.
00:10:15	So these are really the two ways to go: Either via a sizing report for existing systems or via the Quick Sizer if you have a fresh new installation.
00:10:25	Then the second point: Make sure that you understand the prerequisites and make a system ready for BW on HANA.
00:10:32	So understand what releases are available, which dependencies there are between releases of BW and HANA.
00:10:39	Make sure that your BW system is prepared, especially when it comes to housekeeping an data cleanup.
00:10:46	Make sure that your system is in a consistent and kind of lean shape. Avoid all unnecessary data, try to get rid of all unnecessary data.
00:10:55	That's very important in order to make the move to HANA fast and easy. How many systems have we seen where most of the data
00:11:04	was residing, for example, in PSA tables, in statistic and monitoring tables! So we saw a lot of systems where
00:11:12	housekeeping was not done efficiently, and this, of course, is a pity because if you go to SAP HANA or whatever you do,
00:11:23	the smaller your system is the more efficient the operations like backup, like an export for migration will be, and so on.
00:11:30	And with SAP HANA of course, the less main memory you need. Therefore this is now the right time, if you haven't done it before, to start and to do data cleanup
00:11:40	and housekeeping, to be as slim and small from the data perspective as possible, because in the end everything will be faster
00:11:48	and you need less to store the data, of course. Then we showed you the tools which we propose to actually do the migration,
00:11:57	like DMO, PCA, the upgrade manager, all this kind of stuff. Make sure that you understand these tools.
00:12:06	That you understand the place where to use them, the order to use them, and please do use them.
00:12:12	Right. And the last point: Avoid issues, because I mean we've seen many migrations, and migration is always something special
00:12:22	and where you need a certain knowledge, but with the predefined task lists we really

encapsulated there a lot of our knowledge already.

00:12:30   A lot of the best practices on how you should do things, and therefore we really would like to emphasize here to use them.

00:12:38   So this is also shown here in the key takeaway. So our recommendation is clearly to use the direct migration option and the post-copy automation tool to help

00:12:48   really, and they will really help you to make the migration as efficient as possible. We've shown you all the different approaches.

00:12:57   Make sure that you understand them, evaluate them, find the right one for you.

00:13:01   Housekeeping again is very essential and is definitely recommended even in a non-HANA world,

00:13:09   but especially now in this step because this is now the right time; and I think that's it for today.

00:13:15   Next week, or the next unit will already be the wrap-up and now it's time to enjoy the Assessment.

Week 4, Unit 6

00:00:06   Hello and welcome to Week 4, Unit 6, Wrap-Up of our openSAP course.

00:00:18   He just said it, so it's the wrap-up. This means we are at the end of the course and we would like to take the opportunity here

00:00:27   to do a short recap about the key functionalities, the aspects we hope we could bring to you.

00:00:36   We would summarize that, and then we would highlight the roadmap to give you an outlook about the future of SAP BW.

00:00:44   So, what was our main message? It was actually that beside the performance,

00:00:52   and this is something that I will not touch here again, because we really hope that you understood and that you have seen in the demonstration,

00:01:00   in the different units that performance in this manner is something we are not afraid of. We are not caring that much because we have optimized so much.

00:01:10   So I would really like to focus here on our recap about the possibilities of the combination of SAP BW

00:01:19   and SAP HANA in terms of that we have now one common modeling environment enabling us to work in HANA, and to have a seamless integration within BW, and vice versa.

00:01:30   It should also show you that through the combination of both, we have technologies to process very large amounts of data.

00:01:38   So the Smart Data Access technology, for instance. All the stuff of the data management area.

00:01:43   Of course, in addition, we reduce the complexity within SAP BW in reducing the layers,

00:01:52   and the InfoProviders, and so on. And due to that, the combination of both allows us really the strength of an SQL-oriented approach

00:02:00   together with our application-driven approach, which is SAP BW. And this has, of course, an impact on how we think the architecture should look like.

00:02:11   Here on the right hand side we show you what SAP promotes as the so-called LSA++ data warehouse architecture, which is the

00:02:19   successor of LSA specifically for BW powered by SAP HANA. And one fundamental feature which I want to point out here

00:02:29   is that it is basically the black arrows which you see, which go to every layer of your data warehouse, which basically means that you can run queries and analyze data on every layer.

00:02:38   That's a dramatic difference between the classic LSA approach, where we had to use optimized objects for reporting

00:02:47   and quite long data flows until we got there. Now, because of the performance of HANA, we are much more flexible here,

00:02:55   and you can directly get inside into data as it comes into the system. You see also that we reduced the amount of layers, so it's really up to you how much persistency, how much virtualization you are using.

00:03:08   But the key fact here is really that SAP HANA is allowing us to think in a virtualized way, to work with less persistencies,

00:03:17	and this is exactly what's happening here. I think one fundamental change is really that also we see on the bottom here the open operational DataStore layer,
00:03:25	which is really indicating that we are getting more open from a BW application perspective, and besides, that we would like to allow
00:03:35	agile or flexible way of consuming the data very close to the source format. So we have talked about the open ODS view
00:03:44	allowing us really a direct consumption of source data with a special set of semantics in a field-based manner, which means without the need of InfoObjects,
00:03:53	which is opening up this layer for agile data modeling approaches. Other aspects of the open operational DataStore layer are, for example, the ODP source systems,
00:04:03	where we saw completely new capabilities like the SLT trigger-based replication mechanism,
00:04:11	which allows us to do real-time replication in a very generic way based on tables.
00:04:16	We've also seen that this is a concept which renovates existing source system connectivities like the connectivity to the SAP ERP systems,
00:04:27	also between BW systems. You've seen the new monitoring tools behind this, which are much more elaborate than the historic ones are.
00:04:35	You see also that we consider here SAP HANA models also as a possible input, as a possible source, as one model.
00:04:44	We would like to work very seamlessly with a good integration within SAP BW again, the whole thing of the mix scenario.
00:04:52	In the middle layers, you see that we still have our enterprise data warehouse core layer, where we think all the data warehouse specifics definitely should apply.
00:05:02	But we are like we said, we are more open in terms of that we have new objects like advanced DataStore objects working with fields again,
00:05:11	which is really renewing the whole data persistency management in this area. We also have seen the new possibilities which we have in transformations,
00:05:20	for example with the pushdown, automatic pushdown, if it's possible with your model transformation.
00:05:28	The optimize, the expert modes for transformations where you can actually code HANA, write HANA native code into your transformation.
00:05:35	Also, the capabilities of the HANA Analysis process fit in here, because they also, they basically open up a whole variety of algorithms,
00:05:42	which are also relevant for data warehouse transformations, potentially. For the historic data, we have seen the data management ideas
00:05:51	about our multi-temperature approach, as you hopefully remember. That means the SAP HANA Dynamic Tiering, for instance,
00:05:57	allowing us to lower down the needed amount of main memory and working very efficiently with large data volumes. And then we have the architected
00:06:07	data mart area, which is maybe still necessary in case you would like to have a persisted view on several data which is business-specific.

00:06:18	And this is really driven by a lot of the virtualization aspects with the new CompositeProvider, allowing us to join, to union
00:06:27	very flexibly different datasets, no matter if it's different InfoProviders or SAP HANA Models together within BW.
00:06:36	Then on the consumption side we have seen first of all the access via BW queries with different tools.
00:06:42	We've seen Analysis for Microsoft Excel, we've seen Lumira, we've seen Design Studio.
00:06:50	So we have seen a wide variety of modern tools which show you that you can develop very nice and very attractive analytic applications
00:06:59	using the classic way of accessing BW data via a BW query. We've also seen the way of consuming BW data via SQL.
00:07:09	So there you've seen the flexibility that we offer there and the power of the Analytic Manager within BW,
00:07:17	which is really offering you all of the analytic capabilities that you need. So now the question is which piece is missing? And I think we've found it,
00:07:26	and it's on the right hand side, it's the agile data mart area. And this is an area where we would like to offer more
00:07:35	focus on business users, the possibility to work in an agile way with associated internal local little data marts.
00:07:45	So what's the idea here? Very often, a business department is, to like say 90% happy
00:07:54	with the results that they get from the data warehouse, from queries which are developed there, but they have the need to tweak them a little bit.
00:08:00	They want to enrich things with just a small set of data, which maybe could be uploaded via a CSV file, but it has to happen quickly
00:08:08	and they are actually capable of doing this on their own. They have the data, and if they have the means to do this kind of combination they are very happy and they can really, in a very agile way, solve their questions.
00:08:19	Now the point is that historically, such problems were very often solved by taking snapshots of data warehouse data
00:08:29	and bringing it to different environments. Maybe local environments in business departments. Maybe even copies of the same data into different departments from snapshots from different times,
00:08:39	so that after maybe a few weeks, people start arguing about the numbers because they all refer to, in principal the same data, maybe from different time slices,
00:08:49	and people start to argue why they are seeing different results. That's one of the fundamental ideas behind BW workspaces,
00:08:57	that we really want to bring this together and use the idea of just exposing data warehouse data for this kind of agile modeling.
00:09:06	So the idea behind the workspace is really to have a local area where end users can upload data

00:09:14	and then combine it with data which is associated and enabled for this by IT. So it's a process between IT and the business user.
00:09:24	We can switch on the usage of an InfoProvider in a workspace, in this local area,
00:09:30	and then a business user via a different tool, we will see that, and can then upload data and create the combination.
00:09:36	Maybe let's have a look at this in the system. So we will show you what BW workspaces look like from the IT side and from the business department side.
00:09:45	Our last demonstration, so let's go ahead. I hope it works. So let's have a look at the IT side of the story.
00:09:52	So IT is responsible for defining a workspace. Basically giving the business department a playground where they can work.
00:10:00	And the playground basically consists of a certain number of InfoProviders from the data warehouse, from BW.
00:10:08	For example, in this case, we've just picked one of the central CompositeProviders, which we've always been working on throughout this course,
00:10:15	and we've put them here as the central object or as the main provider of this workspace, which basically means that people in the business department can now use this,
00:10:25	the data from this CompositeProvider, and enrich it, for example, with data from a CSV file to for example, add their personal ABC or customer clustering
00:10:35	to the sales data coming from the CompositeProvider. So this here is a one-time activity by IT, switching on the workspace,
00:10:43	defining what is the InfoProvider to access, to give it a few technical settings like how much space you can consume,
00:10:49	and such things, and then I think it's time to upload the data. Almost. One important issue here is always security,
00:10:57	because you want to make sure — that's again an aspect which is often forgotten when data is handed out to other departments maybe to business departments — someone has to make sure that access to this data is restricted
00:11:09	to persons who are authorized to see this data. Now here, we are actual in perfect shape because in BW, we already have an authorization concept. So data is secure and in such a workspace environment,
00:11:22	IT can basically define which users have access to this workspace, in particular.
00:11:28	So we have the BW authorization concept in place and we can also define authorizations and basically authorize a certain amount of users or a certain number of users for a given workspace.
00:11:40	So this is very nicely handled automatically here. Now on the other hand, the business department has a completely different view on this,
00:11:48	which is not SAP GUI-based, it's not Eclipse-based, it's actually implemented in the NetWeaver Business client.
00:11:56	And that's what it looks like. So what you can do now is basically, the central provider is what we saw before,

00:12:03	that's the CompositeProvider. Here you see the technical name YEPM_CP_01 and from a business department's point of view,
00:12:09	you can now add local providers where you upload your own data, typically from CSV files, let's see what we've done here. So here it says we've uploaded a file.
00:12:18	You can actually see the file path, the file gets a name, I called it ABC because it's ABC classification more or less, and that's it basically.
00:12:28	So that's a very simple file upload procedure. And then you can define local CompositeProviders, which combine the central provider with one or maybe multiple uploaded local providers.
00:12:40	So here I defined my local CompositeProvider, and maybe let's have a very quick look at this, the steps that we need here.
00:12:51	So we basically defined which of the local providers we want to use in combination with the central provider.
00:12:58	And here in the model of the local CompositeProvider you basically define the structure of the combination.
00:13:07	So you can specify that in this case, we want to do an inner join. And we basically define the join condition so we have the business partner and the role,
00:13:16	business partner is compounded to role as you probably experienced and have seen in the system. And we basically define the join condition from the local data here on the left hand side
00:13:26	to the CompositeProvider on the right hand side. And that's basically all you have to do. Once you've done with this,
00:13:33	you can basically start working with the data directly. So, what is now the idea here?
00:13:41	You may remember the clustering we did with the SAP HANA Analysis process where we said ok, our business partners belong to a certain cluster,
00:13:50	but this may not be sufficient for us for a certain scenario, so maybe we would like to do a local change to say okay,
00:13:58	Ulrich Christ does not belong to my very important customers, he's less important, so I can maybe do a simulation on the effects.
00:14:06	What would be if I change it, and this is what we are doing here. So this is the source file where you see we have the cluster information
00:14:14	and role, and then the different business partners, and then we can play around and can change the cluster information and do a local view on this by uploading this file and combining it.
00:14:25	Yeah, so after doing this or by modeling the local CompositeProvider you are basically ready to run a query on the local CompositeProvider.
00:14:34	And that can for example be done in Analysis Office, so all of the front-end tools are obviously available again because everything is based on BW InfoProvider technology,
00:14:42	thereby you can define queries or use the default query, for example, with Analysis for Microsoft Excel.
00:14:50	Let's have a look at the query result here for example. So you see that in addition to the

InfoObjects or the fields

00:15:00	which we know from the central CompositeProvider from the back end, we now have this field cluster here. And if, for example, we drill down by cluster
00:15:09	well we get a summary of the key figures according to cluster, and maybe it makes sense to also drill down by business partner
00:15:17	to maybe get the idea of what business partners belong to what cluster. Actually I wanted it the other way round. This is now persisted in the special area within BW.
00:15:29	So locally, it's working on the CompositeProvider data, adding another view on top of it, and that's it.
00:15:35	And I could really now go back into here, my local file, change something, upload the file again in the workspace,
00:15:43	so go back to the workspace, have a look at my local provider, re-upload the file and immediately see the changes.
00:15:53	So this is very agile. Even calling the IT department for this purpose would probably be more time consuming than doing it on your own.
00:16:01	So, I think hands off the system, this should give you the last piece of the overall picture.
00:16:11	The last thing we would like to mention is a bit about our product roadmap. We hope really that you recognize that we invested heavily
00:16:21	in the combination of SAP BW and SAP HANA as a data warehouse. In upcoming releases we will further focus on more
00:16:30	of the pushdown ideas in certain areas, we will simplify the data modeling experience by bringing more and more objects towards the Eclipse-based modeling.
00:16:39	For Big Data we are doing a lot, so it means we will see enhancements and in the near-line storage area. The SAP HANA Dynamic Tiering will be enhanced.
00:16:51	We have started in the previous release also, for example, to expose query definitions, simple query definitions
00:16:59	to SAP HANA as a view. This is something that we are also going to extend. We saw in the planning area that the embedded model is the future.
00:17:09	This is something we will further enhance in terms of flexibility, and you see in the long future also with local planning aspects.
00:17:17	SAP HANA as a platform will obviously grow, so we will also see more and more features there which will help us to drive more and more the Big Data scenarios.
00:17:28	Cloud means the SAP HANA Enterprise Cloud is a big topic for us so we will, or we are working on tools,
00:17:36	also helping you to bring your system into the Cloud. There are already a lot of best practices, but we would like to be very open
00:17:44	if your system is delivered in an on-premise or on-Cloud way. And we actually showed you how to do this, right?
00:17:51	The right migration. And of course we will also continue all the other databases, but we also hope that you get

00:18:00	what the key combination of HANA and BW brings us. So, the very final summary is that if you ask us now,
00:18:09	what shall we do, with which release should we go, the answer is, BW 7.4 SP8 because this is the entry point from your,
00:18:19	or the best entry point with the best integration from now on. Generally, we also want to make very clear that
00:18:28	BW is a central component of SAP's EDW strategy. So BW in combination with SAP HANA is really a very
00:18:38	good entrance point to do data warehousing in an optimized way with leveraging all the strength of HANA.
00:18:44	Okay, so it's time to say thank you very much for the participation.
00:18:49	We really hope that you enjoyed the course as much as we did.
00:18:54	We would like to say thank you to all the people behind the scenes and wish you all the best, and good luck with the Final Exam.

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