GRID & SILICON
Technology explainer

Modular Data Centers: Build, Test, Connect

Can a data center arrive ready to connect?

In the news

What if much of a data center arrived already joined together? On October 21, NVIDIA announced a design for factory-built AI computing units. Partners would fit and test equipment before shipping it. Deliveries are planned for early 2027. The plan still needs prepared sites. Following the pieces helps explain why arriving is only part of getting AI computers running.

The technology behind it

Start with the whole system

Think about setting up a new computer. Taking it out of the box is only the start. You need electricity, a screen and working connections before using it.

An AI system needs more parts working together. AI means computer programs that learn patterns from examples. Those programs need working computers, electricity and cooling. They also need links that carry information between computers.

A data center is a place built to run those computers. A modular data center uses modules (units built to fit together). NVIDIA's DSX POD design puts equipment inside containers made for that job. The containers hold servers (computers that do work for other computers or people). Chips inside the servers do the computing. Racks (cabinets that hold computer equipment) keep servers and their connections in place.

Follow the diagram through Build, Test, Ship, Site ready and Connect. The steps below explain each job. Site work can happen while factory work takes place elsewhere. The diagram shows that separate path joining the delivered unit at Connect.

Build

Start in a factory. Workers fit servers, cables, power equipment and cooling parts inside a container. Build joins computers, cables and cooling parts inside a unit. A network (links that let computers share information) joins the computers. Liquid cooling carries heat away from hot equipment.

In a traditional on-site build, crews fit much of this equipment together inside the finished data center. Different teams bring parts and connect them there. Not every older project follows exactly the same plan.

With DSX POD, partners do much of that joining work at the factory. The factory can be far from the final site. Factory work can begin while crews prepare the place where the unit will run.

Workers finish rack wiring, cables and cooling pipes before shipment. Moving assembly off-site can reduce installation work at the final location.

Real-world example: Imagine a new desk arriving as boards, screws and bags of parts. You must build it before doing homework. A desk that arrives put together can go straight into its space. The room still needs enough space for it. A finished computing unit also needs a prepared place.

Test

Next, check the joined equipment. Test checks that the joined parts work together before shipment. Testing can catch connection problems before equipment reaches the site. Workers can check a problem where the unit was built.

In a traditional on-site build, many checks happen after crews join equipment at the data center. A connection problem found then needs fixing there. Factory assembly moves more of these checks earlier, before the trip.

Testing before shipment does not mean nothing can go wrong later. The delivered equipment still needs safe installation and checks at its final site. Earlier testing gives workers a chance to fix problems before delivery.

Real-world example: You pack a game console for a sleepover. First, you try it with its controller and cables at home. Finding a missing cable now lets you pack it. Finding out after arriving means someone may need another trip.

Ship

Now move the tested unit. Ship moves the tested unit to its final location. Much of the equipment is already joined inside its container. It travels as an assembled unit instead of arriving only as separate parts.

Traditional projects also need deliveries. They may receive many separate pieces that crews then fit together on site. A modular approach moves more of that fitting work before the journey. That can leave less assembly waiting at the final location.

Delivery alone does not make the computers ready to run. The next two steps still matter.

Real-world example: You build a model for a school display at home. You carry the finished model to school in a protective box. You do not bring every loose piece and start building at your desk. You still need a clear place to put the model.

Site ready

While the factory team works, another team prepares the final location. Site ready means power, cooling and network connections are prepared there. The site needs a safe place for the equipment and systems that support it.

The power connection supplies electricity. Cooling equipment carries heat away. The network connects the unit with other computers and services. Without a ready power supply, the computers cannot run.

Traditional projects need these site systems too. In a traditional build, more equipment assembly happens at the site after the building is ready. DSX POD lets more factory work and site preparation happen separately. Teams do not have to wait for every piece of site work before starting factory assembly. Some traditional projects also overlap work; modular building does not invent that idea.

Real-world example: Someone builds a bookshelf in a workshop while you clear its spot at home. You move the old boxes and measure the space before delivery. Building the shelf and preparing its place are two different jobs. Both can happen at the same time.

Connect

Finally, the delivered unit meets the prepared site. Connect joins the delivered unit to those site systems. Trained crews connect its power, cooling and network links. They check the installed system before putting it to work.

In a traditional on-site build, crews first finish more of the internal assembly at the final location. With DSX POD, much of that work is already done. Crews can focus on installing the tested unit and joining it to the site. This can shorten the wait before useful computing begins.

A delivered container still needs working connections. Factory tests do not supply lasting electricity. A truck delivery does not provide cooling. Useful AI computing begins when the equipment and its support systems work together.

Real-world example: A new washing machine arrives already put together. An adult still needs to connect its water, drain and power safely. Leaving it in the hallway does not make it ready to wash clothes. A delivered computing unit also needs its final connections.

Put the five steps together

Look back at the diagram. Build and Test happen before Ship. Site ready follows a separate path because workers can prepare the site during factory work. Both paths must be ready for Connect.

NVIDIA estimates deployment at a prepared site could take 14 days. That equals 336 hours: 14 times 24 hours per day. NVIDIA compares that with six months of traditional on-site deployment. These are company estimates, not a promise for every project. The 14 days do not include all the work to prepare an empty site.

NVIDIA plans partner deliveries for early 2027. The main idea is simple: do more assembly and testing before delivery. Prepare the final place at the same time. Then connect the two parts of the plan.

Key ideas

- Build and test happen before shipping.
- Factory work and site preparation can overlap.
- Delivered equipment still needs working site connections.
- Useful AI computing needs the whole system.

Why this matters to you: Knowing the steps helps you understand what delivery really means.

Words to know

Module: A unit built to fit together with other units. · Network: Links that let computers share information. · Site: The final place where the equipment will work.

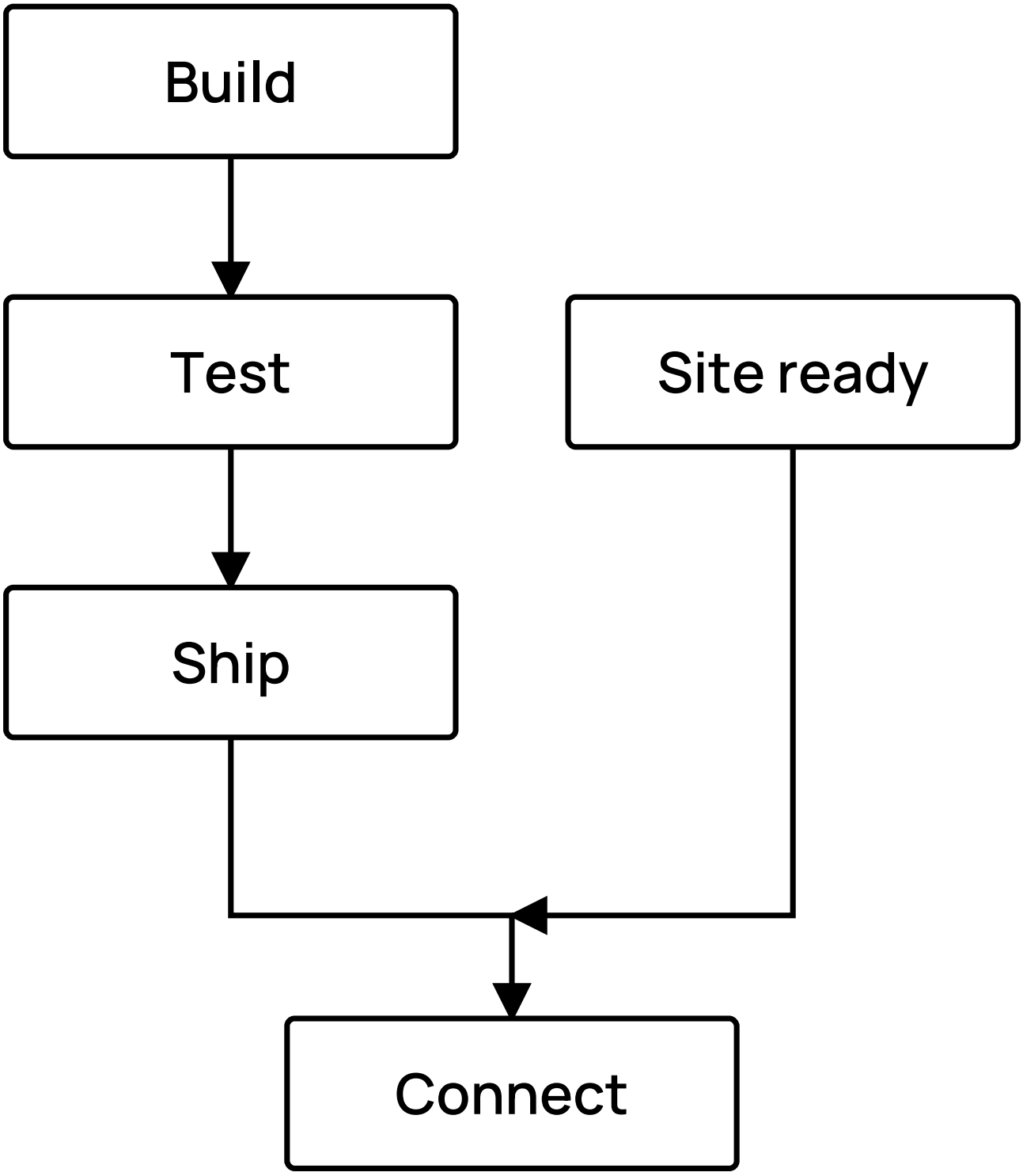
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NVIDIA Introduces DSX POD AI Factories to Accelerate Europe's Infrastructure Deployment

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Read the original announcement using this link or QR code.


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