This is a lecture of how IBM built a computer that plays the very popular game of Jeopardy!.

In 2004, IBM Vice President Charles Lickel and coworkers were having dinner at a restaurant.

All of a sudden, the restaurant fell silent.

Everyone was watching the game Jeopardy!

on the television.

A contestant, Ken Jennings, was setting the record for the longest winning streak of all time, 75 days.

Why was everyone so interested?

Jeopardy!

is a quiz show that asks complex and clever questions like puns, obscure facts, and uncommon words.

It originally aired in 1964.

It covers a huge variety of topics, and it's generally viewed as an impressive feat to do well in this game.

No computer system has ever been developed that could even come close to competing with humans on Jeopardy!.

IBM Research strives to push the limits of science.

It has a tradition of addressing inspiring and difficult challenges over the years.

In the mid '90s, it built Deep Blue, a computer, to compete against the best human chess players, and then in the mid '90s, Deep Blue beat Garry Kasparov, who was at that time the world champion in chess.

Later it built Blue Gene, a computer to map the human genome.

In 2005, a team at IBM Research started creating a computer that would compete at Jeopardy!

Of course, no one knew at the time how to beat humans or if it was even possible.

Six years later, a two-game exhibition match aired on television.

The winner would receive a million dollars.

The contestants were Ken Jennings, the longest winning champion, whose longest winning streak was 75 days; Brad Rutter, who was the biggest money winner of over 3.5 million; and Watson, a supercomputer with 3,000 processors and a database of 200 million pages of information.

This is Jeopardy!-- The IBM Challenge.

And now, here is the host of Jeopardy!, Alex Trebek.

Thank you, Johnny Gilbert.

Thank you, ladies and gentlemen.

And welcome, everyone, to a very special Jeopardy! event.

For the next three days, we're going to be coming to you from this IBM Research facility just outside of New York City.

And let me tell you why.

A little over three years ago, the folks at IBM came to us with a proposal that they considered to be the next grand challenge in computing.

And that was designing a computer system that could understand the complexities of natural language well enough to compete against Jeopardy!'s best players.

Well, they think they've succeeded, and that's why we're here today.

So you are about to witness what may prove to be an historic competition -- an exhibition match pitting an IBM computer system against the two most celebrated and successful players in Jeopardy! history.

Sounds like a lot of fun, doesn't it?

Developed and programmed especially for this moment, making its first appearance on our national television program, ladies and gentlemen, this is Watson.

Just as I expected, that was a very warm reception.

And I'm sure Watson would've appreciated the applause, except for one thing.

Watson can neither hear nor see.

It will be receiving all of its information electronically.

And as a matter of fact, what you're looking at right now is not the real Watson.

This is an avatar.

This is a representation of Watson.

Watson, of course, is a sophisticated computer system too big and too heavy to fit behind that lectern on our stage.

But it is close by.

It's right next door.

And a little while ago, I paid it a visit.

The very first thing you will notice as I come into Watson's space is noise.

There is a lot of noise.

A little bit comes from Watson himself, but most of the noise comes from two very large refrigerator units that help to keep Watson cool.

Now as you can see, Watson has been set up in two units.

Each half contains five separate racks.

Each of these racks contains 10 IBM Power 750 servers.

Now when you link all of these servers together, as they have done for Watson, you create a deep analytic system that is the equivalent of 2,800 powerful computers tied together in a super high speed network.