Services Backlog and Signings

($ in billions)

At December 31:	2019	2018	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Total backlog	$112.4	$116.1	(3.1)%	(2.7)%

The estimated total services backlog at December 31, 2019 was $112 billion, a decrease of 3.1 percent as reported (3 percent adjusted for currency).

Total services backlog includes Infrastructure & Cloud Services, Security Services, Consulting, Global Process Services, Application Management and TSS. Total backlog is intended to be a statement of overall work under contract which is either noncancellable, or which historically has very low likelihood of termination, given the criticality of certain services to the company's clients. Total backlog does not include as-a-Service arrangements that allow for termination under contractual commitment terms. Backlog estimates are subject to change and are affected by several factors, including terminations, changes in the scope of contracts, periodic revalidations, adjustments for revenue not materialized and adjustments for currency.

Services signings are management's initial estimate of the value of a client's commitment under a services contract. There are no third-party standards or requirements governing the calculation of signings. The calculation used by management involves estimates and judgments to gauge the extent of a client's commitment, including the type and duration of the agreement, and the presence of termination charges or wind-down costs.

Signings include Infrastructure & Cloud Services, Security Services, Consulting, Global Process Services and Application Management contracts. Contract extensions and increases in scope are treated as signings only to the extent of the incremental new value. TSS is generally not included in signings as the maintenance contracts tend to be more steady state, where revenues equal renewals. Certain longer-term TSS contracts that have characteristics similar to outsourcing contracts are included in signings.

Contract portfolios purchased in an acquisition are treated as positive backlog adjustments provided those contracts meet the company's requirements for initial signings. A new signing will be recognized if a new services agreement is signed incidental or coincidental to an acquisition or divestiture.

($ in millions)

For the year ended December 31:	2019	2018	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Total signings	$40,741	$44,700	(8.9)%	(6.9)%

Systems

($ in millions)

For the year ended December 31:	2019	2018	Yr.-to-Yr. Percent Change	Yr.-to-Yr. Percent Change Adjusted for Currency
Systems external revenue	$7,604	$8,034	(5.3)%	(4.1)%
Systems Hardware	$5,918	$6,363	(7.0)%	(5.9)%
IBM Z			(1.1)	(0.3)
Power Systems			(13.5)	(12.1)
Storage Systems			(8.9)	(7.6)
Operating Systems Software	1,686	1,671	0.9	2.6

Systems revenue of $7,604 million decreased 5.3 percent year to year as reported (4 percent adjusted for currency). Systems Hardware revenue of $5,918 million declined 7.0 percent as reported (6 percent adjusted for currency), driven primarily by declines in Power Systems and Storage Systems. Operating Systems Software revenue of $1,686 million grew 0.9 percent as reported (3 percent adjusted for currency) compared to the prior year.

Within Systems Hardware, IBM Z revenue decreased 1.1 percent as reported but was essentially flat adjusted for currency, reflecting the mainframe product cycles. Revenue declined through the first three quarters due to the end of the z14 product cycle, but there was strong growth in the fourth quarter driven by z15 shipments. The z15's strong performance demonstrates client demand for technology that offers improved data privacy and resiliency in the hybrid cloud environment. The z15